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APPENDIX A.

AGRICULTURE, FORESTRY AND CONSERVATION.

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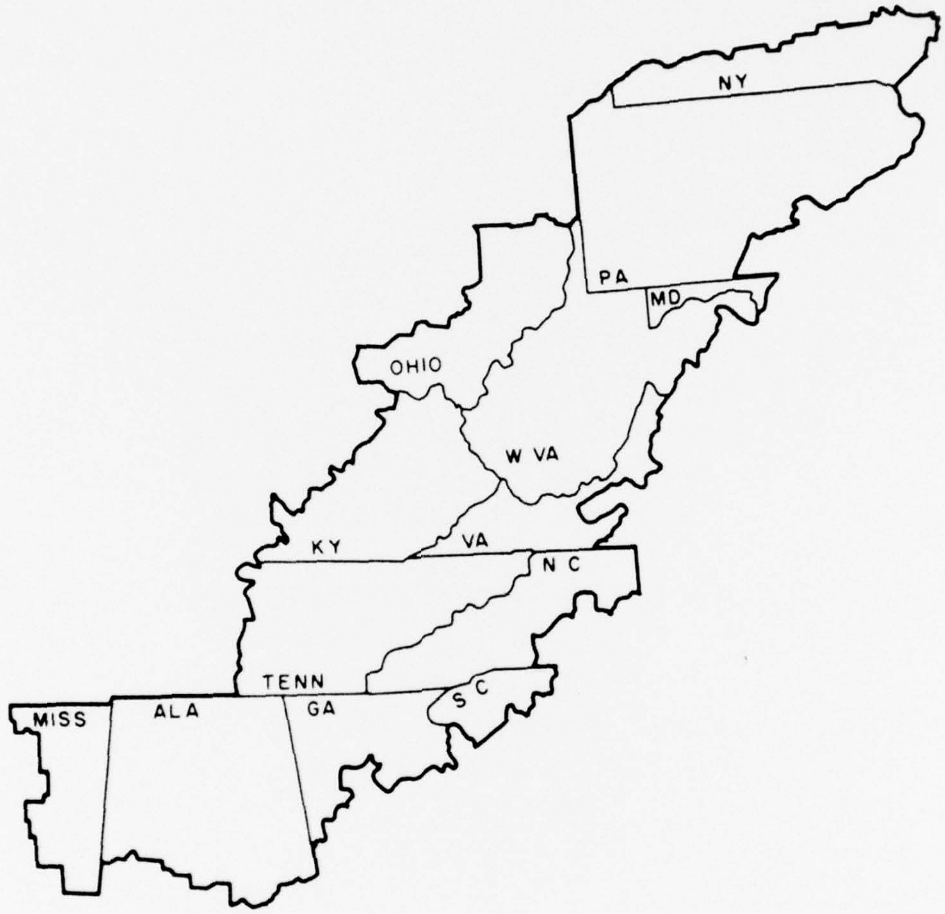
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UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
P. O. BOX 865
Morgantown, West Virginia 26505
October 15, 1968

TO: THE READER

This appendix designated as "A -- Agriculture, Forestry and Conservation" is one of the basic components that constitute the "Report for Development of Water Resources in Appalachia."

The appendix represents a major contribution by the U. S. Department of Agriculture to the Report. Agencies in the Department having primary responsibilities for this appendix were the Economic Research Service, Forest Service, and Soil Conservation Service. Many other offices and agencies in the Department made substantial and significant contributions.

The Main Report consisting of six parts and fifteen volumes should be consulted for an overall view of the Appalachian Region and for more definitive information on a particular part of the Region. Eight appendices, in addition to this one, treat specific subjects. These, of course, contain the detailed information required to support the Main Report.

For any explanation or further information on the contents of this appendix, please address requests to:

Mr. Robert E. Quilliam
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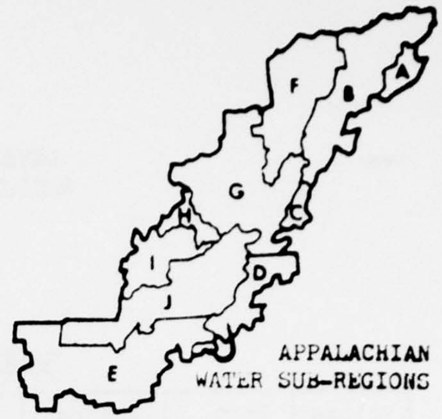
Robert E. Quilliam
State Conservationist

REPORT
For
DEVELOPMENT OF WATER
RESOURCES IN APPALACHIA



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REPORT
For
DEVELOPMENT FOR WATER
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APPENDIX A

AGRICULTURE, FORESTRY AND CONSERVATION

TO

REPORT FOR DEVELOPMENT
OF
WATER RESOURCES IN APPALACHIA

PREPARED AND PRINTED
BY

U. S. DEPARTMENT OF AGRICULTURE

OCTOBER 1968

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1. SUMMARY

Appendix A -- Agriculture, Forestry and Conservation -- is a component of the "Report for Development of Water Resources in Appalachia" and was prepared and developed by the U. S. Department of Agriculture. The Report for Development of Water Resources in Appalachia was authorized by the Appalachian Regional Development Act of 1965 (PL 89-4 as amended by 90-103). The Appalachian Region, as designated in the Act and amendments, includes all of West Virginia and parts of 12 other states. The Region covers an area of about 125.1 million acres.

USDA recommended developments are based on the investigation and study of 198 upstream watersheds totaling 25,610 square miles; the USDA Conservation Needs Inventory (1958) compiled on a county basis; the Conservation Needs Inventory for Watersheds (1967) compiled for each watershed; forest resource surveys; and other special studies.

a. Problems and needs of the Region

Evidence of present soil and water conservation programs is clearly visible in all parts of the Appalachian Region. However, the rate of these programs which deal effectively with most soil and water conservation problems is too slow to meet the objectives of the Appalachian Regional Development Act; although poverty and distress are being alleviated, much more is needed in improving the total human environment. Hence, private investments in the Region are not clearly encouraged by the present rate of removal of the following impediments to growth and development.

(1) Flooding: Floodwater damage in upstream areas of the Appalachian Region is estimated to be $94.8 million annually and will continue to increase. This estimate is based on special watershed surveys and the U. S. Department of Agriculture's 1967 Conservation Needs Inventory for Watersheds (CNI). Of the total estimated floodwater damage, about $24.4 million occurs in upstream watersheds studied to date and summarized for this report. The total floodwater damage in the upstream areas of the Region occurs to an estimated 5.2 million acres of agricultural land and 234,200 acres of urban areas. This represents over 82 per cent of all land in the Region which is presently subject to flooding or about 4.5 per cent of the total land area.

The economic effect of erosion and sediment damage stems from reduced crop yields or complete loss of crops and costs of sediment removal and other restorative measures, all resulting in increased production costs and reduced net income. There are also extensive damages to residential and urban areas, railroads, farm roads and facilities, and highways.

(2) Water supply and quality: The Department of Agriculture's 1967 Conservation Needs Inventory shows an estimated 24 per cent of upstream watersheds in the Region needing municipal and industrial water supplies. The principal water supply problem results from periods of low base stream flow and lack of natural or man-made impoundments.

The economic impediments of low stream flow are further aggravated and complicated by acid mine drainage, untreated or insufficiently treated industrial and municipal sewage, and sedimentation resulting from eroding watersheds and construction sites. CNI data shows almost 49 per cent of upstream watersheds in the Region has the problem of water quality management.

Water impoundments are needed to improve water-oriented recreation in the Region. The CNI data reveals that over 57 per cent of upstream watersheds need water storage for this purpose.

In some areas of the Region, water supply for livestock and rural domestic use is inadequate. For these areas the supply generally comes from springs or dug wells which usually go dry in the summer months. According to CNI data, about 37 per cent of upstream watersheds has this problem.

(3) Land use, treatment and management: The 1958 Conservation Needs Inventory and forest resource surveys show the conservation problems and needs for the following land use.

(a) Cropland: The principal conservation problems are erosion and impaired drainage. There is about 9, 268, 800 acres of cropland, both upland and flood plain, with the dominant problem of erosion; 2, 351, 600 acres with an excess water problem; and 511, 300 acres with unfavorable soil conditions needing treatment. Also, it is estimated that by 1980, due to the limiting natural capabilities of the soil, about 1. 0 million acres of cropland should be converted to less intensive use, such as pasture, woodland, wildlife, or other uses.

(b) Pasture and grassland: About 80 per cent needs improvement and establishment of better vegetative cover and proper management. Land treatment needs by 1980 include an estimated 4,855,800 acres of new pasture planting; 5,133,900 acres needing improvement of vegetative cover; and 2,887,600 acres needing protection from overgrazing and invasion of undesirable plants.

(c) Forest and woodland: Most of the forested area is contributing less than its full potential to the economic growth and welfare of the Region. Improved protection and management is needed to realize this potential and provide high-quality, better-regulated runoff. Approximately 64,760,500 acres of state and private forest and woodland and 1,769,300 acres of National Forests will need land treatment measures by 1980. In addition, increases in fire protection, access roads, and better management are needed to fully develop and utilize forest resources.

(d) Critically eroding areas: These areas are actively eroding, producing both on- and off-site damage through sedimentation, and contributing to increased flooding. Sediment is a product of erosion and is a major concern in water pollution. Surface strip mining for coal and other resources has left many acres without adequate vegetative cover. Critical area treatment for stabilization will be needed by 1980 on an estimated 781,000 acres of surface-mined areas and 112,900 acres of roadbanks. In addition, soil stabilization measures are needed on 58,000 acres of National Forest lands and 1,773,600 acres of state and private forests and woodland, including abandoned logging roads and skid trails.

Other critically eroding areas include streambanks, gullies, heavily used public parks and recreation areas, and new construction areas of commercial and residential development, highways, and public projects.

(4) Population, employment, and income: The population of Appalachia is estimated at 17.5 million. During the period 1950-60, it increased only 2 per cent compared with a growth of 19 per cent for the entire Nation. The Region had an outmigration of slightly over 2 million people during the same period. In 1960, 43 per cent of the population was classified as rural nonfarm, 9 per cent rural farm, and 48 per cent urban.

In 1960, 7 per cent of the work force was unemployed compared to 5 per cent for the country as a whole. This high rate of unemployment was the direct result of the severe employment decline

in mining and agriculture. Between 1950 and 1960, employment in these two industries decreased more than 50 per cent. During this same period, in spite of increases in employment in other sectors of the economy, there was a total decrease of 1.5 per cent in total employment in the Region. By contrast, there was a 15 per cent increase in total employment in the rest of the United States.

During 1964, one of every three families in Appalachia had an annual income of less than $3,000. For the United States, the figure was one family in five. Per capita income in Appalachia is 35 per cent below the national average.

(5) Economic development and growth: Appalachia is a region apart -- both geographically and economically. Industrial cities have developed where coal, limestone, and salt occur together, as in western West Virginia, and where locally produced coal is used with imported iron ore in steel production, as in northern Alabama and western Pennsylvania. The economy of the Region is based primarily on the utilization of natural resources. By far, the largest industry has been coal mining, with forest products second, and agriculture a distant third. About 67 per cent of the Nation's coal is produced in the Region.

Agriculture in Appalachia is decreasing at a faster rate than for the Nation as a whole. In 1949, about 60 per cent of the Region was in farms compared to 61 per cent for the Nation. By 1964, this per cent had decreased to about 46 for the Region and 58 for the Nation. When considering acreages of major crops, with the exception of tobacco and some types of hay, Appalachia plants less than its proportional share of the totals for the Nation.

The picture of the largely rural counties of central Appalachia is primarily that of small marginal farms, abandoned or automated mines, and acute economic depression. Economic problems of the rural interior counties are generally more severe than those of the larger cities.

Appalachia does have many advantages. A major opportunity for farmers to increase their income from agriculture lies in further expansion of the livestock industry. Besides large coal and timber resources and underutilized labor force, the Region has great natural beauty which provides a good potential for a growing recreation and tourist industry. The Region is also located within 300 miles of large market areas populated by 60 per cent of the people in the United States.

b. Resource potential and development for economic growth

(1) Resource potential: There are 125,111,400 acres of land in the Region. Present land use and future needs by 1980 to support planned and expected development is estimated as follows:

Land Use	Present		Needed by 1980	
	Acres 1/	Percent	Acres 1/	Percent
Cropland	22.1	18	19.5	16
Pasture	15.3	12	16.1	13
Forest & Woodland:				
State & Private	67.9	54	67.4	54
National Forests	5.8	5	8.5	6
Other Land 2/	14.0	11	13.6	11
Total	125.1	100	125.1	100

1/ Million.
2/ Farmsteads, roads, idle land, Federally owned land other than National Forests, urban and built-up areas, and other.

About 92.2 million acres, or 74 per cent, of the 125.1 million acres need conservation treatment and are practical to treat. The needs by land use are:

Land Use	No. Acres (Millions)
Cropland	12.1
Pasture	11.2
Forest & Woodland	64.8 1/
Critically Eroding Areas	2.7
Other	1.4
Total	92.2

1/ Does not include the acreages of National Forest land needing treatment.

The 1967 Conservation Needs Inventory for Watersheds delineates and identifies 2,283 upstream watersheds in the Region. Of these, 798 watersheds, totaling an estimated 50.3 million acres, are estimated to be potentially feasible watershed projects. As of July 1, 1967, 175 upstream watershed projects, totaling about 9.8 million acres, had been completed or were being installed. The remaining 1,310 upstream watersheds at present either have no water

resource problems requiring group action or their solution is not considered feasible. The following is a complete analysis of the number and status of upstream watersheds in Appalachia.

TOTAL (1967 CNI for Watersheds)			2,283
1. Completely Installed (7/1/67)	36		
2. Being Installed (7/1/67)	139		
Subtotal		175	
3. Feasible (1967 CNI for Watersheds)			
a. Recommended Acceleration over 20 years 9.9/yr.	198		
b. Going Program over 20 years 17.5/yr.	350		
c. Remaining Feasible by 1990	250		
Subtotal		798	
4. Other Watersheds	1,310	1,310	
Total		2,283	2,283

The 5.8 million acres of federally owned land in the 15 National Forests have great potential for development of recreational opportunities. The planned accelerated development includes 15,730 acres providing 1,880 individual sites for various recreational activities, 4,050 acres of recreational impoundments, and 53 major recreational complexes. Present recreational developments are not meeting current demand nor can they meet projected future demand without a greatly accelerated development program.

(2) Resource development: Essentially, the recommended developments require acceleration of present going programs through increased funding, changes, and modifications. This acceleration is over and above the present rate of accomplishment of going programs. Both the recommended acceleration and present rate of going programs will not meet the total needs.

The recommendations and proposals are geared to supply the necessary flood protection, water supply, and recreational opportunities to designated growth areas, protection, and development of watershed areas directly above completed, authorized, and planned water resource developments, as well as development of areas throughout the Region to stimulate overall economic growth.

USDA programs to accomplish accelerated land treatment needs were developed for a 10-year period. Land treated would total 16.5 million acres, or 18 per cent, of the 92.2 million acres needing treatment and practical to treat. This would be over and above the present rate of accomplishments. It would involve planning and installation of conservation measures on the following:

Land Use	Acceleration No. Acres (Millions)
Cropland	3.2
Pasture	3.2
Forest and Woodland	7.8
Recreation and Wildlife	1.1
Critically Eroding Areas	1.2
Total	16.5

The 198 recommended feasible upstream watersheds comprise 25,610 square miles or about 13 per cent of the Region. Identified water development needs include storage for the following:

Purpose	Storage Acre-Feet
Flood Prevention	1,836,800
Municipal & Industrial Water Supply	194,300
Supplemental Irrigation	3,800
Recreation, Water-oriented (27,200 surface acres)	365,600
Water Quality Management	64,800
Other or Future Needs	1,285,300
Total	3,750,600

Most of the recommended developments on National Forest lands are planned for the Appalachian Highlands Recreation Study Area or more mountainous sections and include:

1. Acquisition of over 2, 650, 000 acres of land within and adjacent to National Forests. Acquisition of this land will permit improved watershed management and protection, increased timber production, reduction of sediment, improved regulation of run-off, and improved fire control. Public acquisition of private lands within the proclamation boundaries of National Forests is desirable because they often preclude proper development of major recreation complexes. This acquisition program will permit preservation of outstanding scenic attractions and the aesthetics and natural beauty of many areas. It includes many areas presently unutilized or underutilized because of inaccessibility. Development of these lands will stimulate private capital investment in adjacent areas.

2. Over 15, 730 acres of recreation developments providing 1, 880 individual sites for various recreational activities and containing the necessary recreational activities. In addition, 53 major special recreation complexes and 4, 050 acres of recreational impoundments are proposed.

3. Transportation developments planned on National Forests call for the construction of 6, 600 miles of access roads and trails, bridges, observation sites, and roadside developments. These are needed to permit utilization of many largely inaccessible areas for reforestation, timber stand improvement, harvesting operations, improved hunter and fisherman distribution, development of recreational opportunities, and improved fire and erosion control.

4. Fire control is needed to reduce the average annual burn, provide additional protection, permit greater development and utilization of the forest resource. This includes 225 miles of firebreak construction, four fire weather stations, four lookout towers, and four heliports, 700 helispots, and two air tanker bases.

5. Fish and wildlife developments are needed to improve habitat and help reduce the impact of increased hunting and fishing pressure. This includes 1,900 acres of water developments and 21,800 acres of stream and lake habitat improvement.

The above programs are interrelated and require coordinated planning and development if their full potential and impact are to be realized.

There are also six Resource Conservation and Development Projects which have potential to assist in economic growth and development of the Region.

c. Impact of resource development potential on economic growth

(1) Benefits: Current USDA programs of land treatment and structural measures contribute to stabilization and growth of the economy of the Region. Acceleration of these programs will further strengthen the rural economy, stimulate community development and economic growth, and improve environmental quality. Both employment and income will be increased initially by planning and carrying out the land treatment practices and structures recommended in the program. Much of the work is of the type which can be done using local labor -- persons who are presently underemployed or unemployed, who already posses or can easily acquire the necessary job skills "on-the-job." Most of the increased income will be respent in the local economy, generating further increase in employment and income. The estimates of additional economy activity presented below include only the increase due to acceleration of current programs. They are based on procedures adapted by USDA from Corps of Engineers' procedures.

The planning and installation of land treatment measures on cropland, pasture, recreation, wildlife, forest and woodland, and critically eroding areas will generate annually during periods of installation the following estimated employment:

	Employment in Man-Years		
	Direct	Induced in Service Sector	Total
Technical Assistance in Planning and Installation	1, 230	1, 020	2, 250
Installation	3, 540	3, 040	6, 580
Total	4, 770	4, 060	8, 830

The increase in employment will be associated with an estimated $80 million annual growth in net income for the Region. The increase in net income includes: (a) user benefits of $44 million from more efficient use of cropland and pasture, through stabilization of critically eroded areas, and from recreation and fish and wildlife benefits; and (b) expansion benefits of $36 million based on the use of an income expansion multiplier.

Some annual physical effects of the accelerated land treatment program include:

(a) 2. 7 million tons of increased crop and livestock production representing gross returns of $286. 2 million;

(b) 600 million cubic feet increase in timber growth representing gross returns of $545 million from timber products delivered at the mill;

(c) reduction of 66 million tons of sediment from critically eroding areas;

(d) 2. 3 million visitor-days' increase in the supply of recreation principally from fish ponds, picnic areas, and campgrounds developed by private individuals.

Planning and installation of the recommended 198 upstream watersheds for water resource development will provide total estimated benefits including expansion benefits both national and regional of $160. 5 million annually. This includes users' benefits for flood damage reduction, land enhancement both agricultural and urban, recreation and fish and wildlife, water supply including municipal and industrial, water quality management, irrigation, and incidental recreation benefits. Redevelopment benefits were divided between

national and regional accounts and are estimated to be $4.5 million annually for both regional and national and $2.7 million annually for regional only. These benefits accrue from the otherwise unemployed labor used in construction and operation and maintenance of the developments. The national expansion benefits from agricultural enhancement are estimated at $643,000 annually. Estimated annual benefits for industrial development amount to $24.6 million national benefits and $91.9 million regional benefits. Regional benefits for recreation are estimated to be $5.9 million annually.

Additional details regarding the effects of installation of the recommended structural measures include:

1. Flood protection would be provided to an estimated 947,000 acres of flood plain with protection from the 100-year flood event for 20,000 acres in or near designated growth centers, which would be suitable for nonagricultural development and a minimum protection from the 2- to 5-year event for the remainder which is adequate for most agricultural use.

2. An estimated future population of 533,000 would be served by the recommended developments of municipal and industrial water supplies.

3. An estimated 30.1 million visitor-days annually of high-quality recreation would be provided by the proposed developments on National Forest lands. Other benefits will accrue from the acquisition and management of an additional 2.6 million acres of forest land due to enhanced scenic values, preservation of natural beauty, reduced erosion and sediment production, better regulation of runoff, increased timber production, and better access.

4. An estimated 12.3 million recreation-days annually would be provided by the 198 recommended upstream watersheds.

5. A high priority will be given for planning and installaing 17 of the 198 recommended upstream watersheds, which will provide sufficient flood protection for industrial, commercial, or residential site development in or near designated growth centers. An

estimated 25,500 new jobs would be created over a period of 25 to 50 years. These jobs would have an estimated total annual payroll of $245.7 million. This payroll includes both the manufacturing and service sectors of the economy.

6. The present employment of 86,000 in timber-based manufacturing industries is projected to increase by more than 10,000 by the year 2000. This would result in the total employment with an annual payroll of an estimated $500.0 million. 1/

(2) Costs: The total installation cost of the recommended land treatment measures for cropland, grassland, forest and woodland, critical area stabilization, and recreation and wildlife land is estimated to be $513.4 million.

The installation cost for 198 upstream watersheds for water resource development is estimated to be $508.9 million. This includes costs for construction, installation services, land easements and rights-of-way, and administration of contracts. After 1990, plan and install the remaining 250 feasible upstream watersheds as shown by 1967 Conservation Needs Inventory for Watersheds at an estimated cost of $499.0 million.

The estimated installation cost for structural measures on State and National Forest land is $784.2 million. This includes cost for recreation, transportation, fish and wildlife development, land acquisition, and fire protection.

d. How U. S. Department of Agriculture's recommendations are to be carried out

The recommended development will be accomplished through an acceleration of going agency programs using existing authorities with such minor modifications as are indicated below:

1/ Forest Statistics for Water Sub-Regions of the Appalachian Region, based on Forest Surveys and related estimates of the Forest Service, USDA, and other surveys. Prepared by William S. Stover, Forestry Consultant, August 1967.

Agricultural Stabilization and Conservation Service (ASCS): Accelerated cost-sharing on land treatment measures to be installed on areas identified with designated growth centers using existing authorities of the Soil Conservation and Domestic Allotment Act, modified to provide for special regional funding and for 100 per cent Federal cost-sharing on those stabilization measures which provide primary off-site benefits, and PL 89-4, Section 203, modified to eliminate the 50-acre restriction for those critical areas identified with growth centers.

Farmers Home Administration (FHA): Provide Water Development and Soil Conservation Loans, Watershed Loans, Association Loans, and Loans and Grants for community water and sewer systems for rural areas under existing authorities.

Forest Service (FS): Administer the National Forests and provide technical and cost-sharing assistance to Cooperative State and Private Forestry Programs, Watershed Protection Programs, Resource Conservation and Development Projects, and the Appalachian Regional Program under existing authorities.

Provide for Forest Service programs for Appalachia with financing at the maximum level authorized by law. This financing would provide technical assistance and protection through the States to forest and woodland owners and forest product processors.

Soil Conservation Service (SCS): Provide technical and cost-sharing assistance to Soil Conservation District Programs, Watershed Protection and Flood Prevention Programs, Resource Conservation and Development Projects, National Cooperative Soil Survey Programs, and the Appalachian Regional Development Programs under existing authorities with the modifications indicated.

1. Provide technical assistance and cost-sharing to state and county road agencies, local units of government, and contractors for planning and installing soil and water conservation measures on eroding secondary roads, rights-of-way, and during and after new highway and other construction in highly erodable soils.

2. Provide technical and cost-sharing assistance at an accelerated rate for stabilization of abandoned strip-mined areas on privately owned land through soil conservation districts. Cost-sharing not to

exceed 100 per cent of the costs when benefits will accrue primarily off-site and 50 per cent when primarily on-site.

3. Provide Federal cost-sharing of storage for water quality management in accordance with other national programs.

If experience in the implementation of this program indicates that additional authorities are needed, subsequent proposals for new legislation will be developed.

e. Conclusions

The Appalachian Region has an abundance of natural resources. Full development and utilization of these resources is difficult and limited by rugged terrain, land ownership patterns, an inadequate transportation system, poor quality and distribution of water, and past and present misuse of the land. The lack of long-term investment money, time, skills, and equipment on the part of the individual landowners needed to install the conservation land treatment practices presents a difficult problem in the implementation of the recommended programs.

The solution of many problems and needs of the Appalachian Region is closely tied to development and use of all natural resources. All land and water in the Region are directly involved. The wise use, development, and management of all natural resources is therefore basic to economic growth and welfare of Appalachia.

Agriculture is a highly competitive business and has long been caught in an ever-tightening cost-price squeeze. The cost of almost all things needed in agricultural production has been and is rising at a faster rate than prices received for agricultural production. The planning and implementation of basic conservation plans, for all land uses, will result in increased efficiency and net income. This will have a definite stabilizing influence on the rural economy and increase the level of economic activity in growth areas and market centers. It also will tend to reverse the flow of rural people to metropolitan centers and help ease the pressure exerted by their constantly expanding populations.

Appalachia has the potential and is ideally located to provide outdoor recreational opportunities to the densely populated eastern half of the country. Nearly 13.4 million acres of public and private

land and more than 1.4 million acres of water provide a tremendous resource potential for outdoor recreation.

The Department's recommended proposals will help provide for more efficient and greater utilization of the Region's water and related resources. They will stimulate growth and enhance the well-being of the rural and small communities of the Region. This growth will complement and supplement the planned development of the large metropolitan areas making possible greater overall benefits to the Region.

The Department recognizes that, as various public and private investments in the Region increase and other economic factors are brought into play, conditions will change over time. It therefore proposes that from time to time after implementation of the proposed accelerated program, the need for its continuation be examined and evaluated.

f. Recommendations

The U. S. Department of Agriculture in this report recommends:

1. That an accelerated conservation land treatment program over and above rate of present programs be planned and installed in accordance with the following priority:

    a. Stabilization of critically eroding areas throughout the entire Region with special emphasis on areas upstream from all completed, authorized, or planned USDA, Tennessee Valley Authority, Corps of Engineers, and other water resource developments. To be accomplished during the period 1970-80.

    b. Acceleration of land treatment on watersheds of recommended projects for Corps of Engineers (15-20), Tennessee Valley Authority (1), and USDA Upstream Watersheds (198). The area involved equals about 22 per cent of the Region. To be accomplished by 1990.

c. Acceleration of land treatment on watersheds of completed and authorized water resource developments of the Corps of Engineers, Tennessee Valley Authority, and other public and private interests. Area involved equals about 28 per cent of the Region. To be accomplished by 1990.

d. Acceleration of land treatment on remaining areas of the Appalachian Region. To be accomplished by 1990.

For further details, see section 10.

2. That an accelerated planning and installation of structural programs be implemented as follows:

a. Plan by 1980 and complete installation by 1990 the 198 recommended PL-566 Upstream Watersheds together with recreational and other developments in the National Forests. Also accelerate rate of installation of the 139 presently authorized upstream watershed projects so as to complete installation by 1980. It is expected an estimated 38 of the 198 watersheds will have been authorized under going program before 1980. A high priority will be given to 17 of the 198 recommended watersheds which will provide sufficient flood protection for industrial, commercial, or residential site development. Priority for others of the 198 recommended watersheds is indicated in section 10 and Water Sub-Region Reports. These reports also show the relationships of these potential projects to growth areas, their potential for industrial and multiple-purpose development, relation to Interstate or Appalachian developmental highways and commercial airports, and the interest of local people.

b. After 1990, plan and install 250 feasible upstream watershed projects remaining from the total of 798 potentially feasible watersheds shown by the 1967 Conservation Needs Inventory

for Watersheds. By 1990, an estimated 350 watersheds of the 798 will have been authorized under the present going watershed program.

3. That necessary action be taken to implement the new approaches and modifications of present programs as listed in section 9e of this report.

4. That the Main Report recommend the funding for the first year's acceleration. Funding of the accelerated program in subsequent years will be by the Appalachian Regional Commission. The Department will maintain close cooperation with the Appalachian Regional Commission. Proposals for changes in existing authority will be made to the Appalachian Regional Commission for possible inclusion in proposed legislation to the 91st Congress.

5. That the Department's proposed accelerated programs be referred annually to the Appalachian Regional Commission for its review, suggestions, and support as a compatible element in the total developmental program for the Region. It is expected that the Department's program will be directed toward recognized growth centers in the Region in order that the impact of these investments will be most rapidly felt in the economy.

Copies of watershed investigation reports for the 198 recommended upstream watersheds and details regarding the land treatment program are available from State Offices of the U. S. Soil Conservation Service. Recommended developments for forest and woodland and National Forests may be secured through various offices of the U. S. Forest Service.

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2. INTRODUCTION

The U. S. Department of Agriculture was requested to assist the Secretary of the Army in making a water resource survey of the Appalachian Region. This survey was unique in several respects. For the first time, a legislative act for water resource planning required the preparation of a comprehensive plan particularly designed and formulated to stimulate economic growth of a region. Methods used in evaluating and analyzing benefits of water resource developments differed in several important respects from the usual procedures. Also, the area covered by the survey comprises a large region which is not tied to the usual hydrologic units of river or subriver basins. The plan will conform with two main aspects of national policy: economic development and growth, and natural resource conservation and development.

The Appalachian Region, while having many abundant natural resources, has lagged behind the rest of the Nation in economic growth. Its 17.5 million people have not shared proportionally in the Nation's prosperity. Water and land resources have been inadequately developed or poorly utilized. Frequently, poor quality and too much or too little water, along with undeveloped water and land resources, have hampered or prevented economic growth.

This appendix summarizes results of the U. S. Department of Agriculture's participation in the survey. It is an integral and important part of the recommended plan for development of water and related land resources. The plan gives special attention to water and related land resource development opportunities which will stimulate economic growth and improve the welfare of people in the Region.

The portion of the overall plan covered by this report was closely coordinated and reviewed by all participating State and Federal agencies and groups. Thus, the Department's plan constitutes a needed and harmonious component of the overall regional economic development program for Appalachia.

a. Authority

The survey was authorized under Section 206, Public Law 89-4, the Appalachian Regional Development Act of March 9, 1965, as amended. This section directed the Secretary of Army to prepare a comprehensive plan for the development and efficient utilization of water and related resources of the Region. To assist with the survey and development of the plan, the law required participation of the

Secretary of Agriculture; Secretary of Commerce; Secretary of Health, Education, and Welfare; Secretary of the Interior; Tennessee Valley Authority; and Federal Power Commission. Close counseling and review were also required of various state agencies having responsibilities in the field of natural resources and under other sections of the Act.

The Secretary of Army designated the U. S. Army Corps of Engineers to conduct the survey and prepare the plan. Under Section 6 of the Watershed Protection and Flood Prevention Act (PL-566, 83rd Congress 68 Stat. 666), the Secretary of Agriculture designated the Soil Conservation Service to provide leadership in carrying out Department responsibilities. Economic Research Service and Forest Service participated in the survey and development of the plan and had major responsibilities. The Department's participation was started and funded in late 1965. Full-scale field work got underway in June of 1966 and was completed in November of 1967.

b. Objective and nature of study

The primary overall objective is to stimulate economic growth and improve the welfare of the Region through the coordinated and orderly conservation, development, use, and management of water and related land resources. The plan provides means for expanding economic opportunities through flood prevention, improved water quality, and an increase in production of needed water and related goods and services. It has been keyed to those areas having significant potential for economic growth.

The Department's plan will complement and contribute substantially to the economic development programs of the Appalachian Region. It has been closely integrated with downstream developments and is scheduled for installation in the next 10 to 20 years. Projections of water and related land resource needs were developed for the years 1980, 2000, and 2020.

c. Location and extent of study area

The Appalachian Region contains parts of six major drainage areas and all or parts of 38 river basins, as designated in the "Atlas of River Basins of the United States," prepared and published June 1963 by the U. S. Department of Agriculture, Soil Conservation Service. The Region extends about 1, 100 miles in a southwesterly direction from the northeast corner of Schoharie County, New York, along the Appalachian Mountains to the southwest corner

of Kemper County, Mississippi. At the maximum width, it extends across parts of four states (Mississippi, Alabama, Georgia, and South Carolina) for a distance of about 500 miles. The Region covers an area of 195,485 square miles, or about 7 per cent of the conterminous United States. It includes all of West Virginia and parts of 12 other states -- Alabama, Georgia, Kentucky, Maryland, Mississippi, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, and Virginia -- and consists of a total of 397 counties.

The percentage of each state in Appalachia and its portion of the Region as a whole is as follows:

State	No. of Counties	Area in Appalachia (Thousand acres)	% of State	% of Region
Alabama	35	15,869.9	49	13
Georgia	35	6,928.5	18	5
Kentucky	49	10,845.6	43	9
Maryland	3	992.0	15	1
Mississippi	20	6,594.5	22	5
New York	14	7,589.0	25	6
North Carolina	29	7,629.7	24	6
Ohio	28	8,765.7	33	7
Pennsylvania	52	23,469.6	82	19
South Carolina	6	2,534.0	13	2
Tennessee	50	12,478.2	47	10
Virginia	21	6,004.7	23	5
West Virginia	55	15,410.0	100	12
Total	397	125,111.4	--	100

Size of the Region can be further illustrated by the fact that its boundaries extend to within about 10 miles of Atlanta, Georgia and Cincinnati, Ohio; 55 miles of Cleveland, Ohio; 25 miles of Buffalo and 12 miles of Albany, New York; 50 miles of New York City and Baltimore, Maryland; 60 miles of Philadelphia, Pennsylvania; and 40 miles of Washington, D. C. The Region also borders on Lake Erie and is within 140 miles of the Gulf of Mexico and 28 miles of the Mississippi River.

The Region was divided into 27 Economic Sub-Regions. Economic base information and projections were developed for these Sub-Regions. To better fit state need for planning and development, these Economic Sub-Regions were further divided into 63 state

planning areas. These areas have been numbered by the Appalachian Regional Commission and run from 1 to 60 with four being sub-divided and two combined. For ease in developing a plan and writing a report, the Region was divided into 10 Water Sub-Regions. Boundaries of these divisions were along county lines. For the most part, these boundaries do not divide state planning areas. Data and information in this appendix are presented on the basis of the 10 Water Sub-Regions. See plate 3 and table XLIV for details on counties, Water Sub-Regions, and size of the Region.

d. Intensity of investigation

The three agencies in the U. S. Department of Agriculture with major responsibilities for the survey set up staffs with full-time personnel. Work of each agency was then planned, supervised, and coordinated by these staffs. A large part of the work load fell on personnel from the Washington, state, regional, area, and other offices of the three agencies.

A major part of the Department's efforts in this survey was the investigation of 100 upstream watersheds. The basis for selection was (1) watersheds having water and related resource problems which were hindering or preventing economic growth, and (2) local people being interested in their solution. In all cases, selection was coordinated with and the final decision made by the state member of the Water Development Coordinating Committee for Appalachia. These watersheds were studied to the intensity necessary to determine their water and related land resource problems, solutions, full potential development, and feasibility. Selection of these watersheds was guided by their location and potentially favorable effect on economic growth of the designated areas.

Primary consideration was given to providing land treatment, flood plain protection, municipal and industrial water supply, recreation, irrigation, and other water storage or services that would permit and encourage agricultural, forest, and industrial development, either inside or outside the watershed. Investigation of the 100 upstream watersheds required checking and work in the field by the Forest Service and Soil Conservation Service. Estimates were made to determine the potential increase in economic activity which would be generated by installation of these water resource developments.

Data and information from detailed studies of an additional 284 upstream watersheds were used in this report. This includes 175 watersheds completed or authorized for installation, 39 recently

studied under USDA PL-566 Upstream Watershed Program, and 70 watersheds under the following River Basin Studies: James, Kanawha, Potomac, and Tombigbee. Some data in tabular form was also included from the Genessee, Ohio, and Susquehanna River Basin Studies.

Broad overall conservation land treatment needs and land use changes for the Region were developed and summarized from the 1958 National Inventory of Soil and Water Conservation Needs (compiled on a county-by-county basis) and Forest Resource Surveys. In addition, water resource problems and needs for each upstream watershed were summarized from the 1967 Conservation Needs Inventory for Watersheds. An appraisal was made of multiple-use management plans of the 15 National Forests, totaling about 5.8 million acres of federally owned land in relation to optimum development of the water and related land resources of the Region. Particular attention was given to plans for development of recreational use and facilities in the National Forests.

e. Participants

The three agencies of the U. S. Department of Agriculture having major responsibility for this survey were the Economic Research Service, Forest Service, and Soil Conservation Service. These agencies worked under the general direction of a USDA Field Advisory Committee for Appalachia with overall guidance from a Washington Advisory Committee. Membership of both committees consisted of a representative from the three agencies. Each agency was responsible for contacts with their own units, divisions, bureaus, or offices having responsibilities in the 13-state Region. This included over 43 different offices.

Other agencies in the Department making a substantial contribution to the survey included the Agricultural Research Service, Agricultural Stabilization and Conservation Service, Farmers Home Administration, and Rural Electrification Administration.

f. Acknowledgements

Excellent assistance and cooperation were received from many local groups, state, and other Federal agencies during the survey. Included were many local and national, civic and conservation organizations, towns, cities, soil and water conservation districts, and state forestry and other agencies in the field of natural resources. From the Federal sector were the Appalachian Regional Commission; Office of Appalachian Studies, and 12 Districts, U. S. Army Corps of Engineers; Bureau of Mines; Bureau of Outdoor Recreation, Federal

Water Pollution Control Administration, National Park Service, Bureau of Sport Fisheries and Wildlife, and U. S. Geological Survey of Department of the Interior; Department of Health, Education, and Welfare; Department of Transportation; Federal Power Commission; Office of Business Economics; and Tennessee Valley Authority.

3. NATURAL RESOURCES OF THE REGION

The Appalachian Region is blessed with an abundance of many natural resources. Included are land, water, forests, fish, wildlife, minerals, climate, and scenic beauty.

Overall, water is one of the more abundant natural resources. However, poor distribution and quality of water are often times serious problems which restrict growth and development. Proper soil and water management and development of other natural resources are key factors in the economy and development potential of Appalachia.

The rugged and steep terrain features of the Region offer much in the way of scenic beauty but restrict the use of the land, making access difficult and hampering development of its natural resources.

The most valuable marketable mineral resource in the Region is coal. This mineral underlies a large part of the central and western half of the area. Other valuable mineral resources found within the Region are oil, gas, metals, and non-metallic minerals.

The soil and climate of Appalachia are well suited for the production of timber which can provide a major means of revitalizing the Region's economy. The Region is recognized by the wood-using industries as an area that produces hardwoods of outstanding qualities and properties.

a. Climate

The Appalachian Region has a Moderate Continental-Forest Climate that varies with longitude, latitude, and elevation. In general, there is a southward gradation of increasing temperatures, but sharp differences in temperature and precipitation occur between mountain areas and lowland areas, only a few miles apart.

The normal eastward movements of air masses across the Region frequently cause severe chilling in winter and heating in summer. From March through September, the Region is characterized by frequent high-intensity, short-duration thunderstorms. The abrupt and severe changes in the climatic conditions of this Region cause occasional hailstorms. Mountains of Appalachia provide protection to most of the Region from hurricanes that occur along the coastal areas.

In the southern portion of the Region, growing seasons are longer and more favorable for crop production than in the northern

part or in areas of higher elevation. Length of the growing season and other climatic conditions of a particular area influence the type of crops grown within the Region.

(1) Precipitation: Annual precipitation in the Appalachian Region ranges from 35 inches in New York and Pennsylvania to more than 55 inches in Alabama. Small areas in North Carolina receive as high as 80 inches. Average annual precipitation for the Region is 47 inches, which is 18 inches more than the average for the conterminous United States. There are only two other areas of similar size in the United States where the average annual precipitation is greater. Most of the precipitation is due to the eastward flow of moisture-laden air masses being forced upward over the mountainous areas. This normally produces areas of high precipitation on the western slopes and tops of the mountains and lesser amounts on the eastern slopes. This effect is very noticeable in North Carolina where the average annual precipitation varies from more than 80 inches to less than 40 inches within a distance of 50 miles. In West Virginia and along the Tennessee-North Carolina border, there are also areas of high precipitation resulting from topographic influences.

Snowfall in the Region ranges from more than 100 inches annually in the higher elevations to less than three inches in northern Alabama. Occasionally, snowfalls of more than 20 inches are deposited during a single storm in areas of New York, Pennsylvania, and West Virginia. The influence of elevation on the amount of snowfall can be seen by comparing the average annual snowfall of 115 inches at Pickens, West Virginia to 20 inches at Charleston, West Virginia, a distance of about 75 miles. Also, in 1930-31 a record snowfall of 148 inches was measured at Mount Mitchell, North Carolina.

(2) Temperature: Temperatures for the Region vary with longitude, latitude, elevation, and flow of the air masses.

For northern Appalachia, in New York and northern Pennsylvania, the average annual temperature is about 49° F.; winter mean about 27° F.; and summer mean about 71° F. The record high is 111° F., and the record low is -39° F.

In Alabama, Georgia, and Mississippi, the southern part of the Region, the average annual temperature is about 65° F.; winter mean about 48° F.; and summer mean 82° F. The record high is 112° F., and the record low is -18° F.

(3) Growing seasons: In the northern half of Appalachia, the growing season varies from 120 to 200 days, with the lower limit reflecting the influence of more severe climatic conditions characteristic of higher elevations. The average first killing frost for this sector of Appalachia occurs about September 30th. The last killing frost occurs about May 20th.

For the southern half of the Region, the growing season length varies from 198 to 298 days. The average first killing frost occurs about October 30th. The last killing frost occurs about March 30th.

b. Physiography and geology

This Region is made up of seven different physiographic provinces. Each of these provinces has a northeast-southwest orientation, and they occur about parallel to each other.

Forty-nine per cent of the Appalachian Region is within the Appalachian Plateau Province. This province consists of more or less horizontal sandstones, shales, and conglomerate beds with deposits of limestone, coal, oil, and gas throughout the province, with iron deposits in Alabama.

The Valley and Ridge Province borders on the east of the Appalachian Plateau Province. This represents 19 per cent of the Region and is sometimes referred to as the Young Appalachian Province. The ridges and valleys are composed or underlain with sedimentary rocks which reflect the repeated uplift and erosion processes that have occurred. This province includes the "Great Valley," the majority of which is underlain with limestone.

The Blue Ridge Province, or the Older Appalachian Mountain Province, represents 10 per cent of the Region. This lies between the Piedmont Province on the east and the Valley and Ridge on the west. This province is composed of crystalline rocks, including granite, gneiss, and schist.

Eight per cent of the Region is in the Piedmont or Foothill Province. This is the most easterly province and is underlain mostly with gneiss, schist, quartzite, granite, gabbro, and limestone.

The remainder of the Region has 7 per cent in the Coastal Plains, 6 per cent in the Interior Low Plateau, and about 1 per cent in the Central Lowland Province.

(1) Topography: The topography of the Region varies widely in extending from northeastern Mississippi and central Alabama in a northeasterly direction through portions of Georgia, Tennessee, South Carolina, North Carolina, Virginia, Kentucky, West Virginia, Ohio, Maryland, Pennsylvania, and New York. Some of the highest peaks and most sharply dissected plateaus east of the Rocky Mountains occur within the Region.

The Great Smokies and Black Mountains of the Blue Ridge Province contain the most rugged terrain in the Region. In this province, Mount Mitchell, located a few miles northeast of Asheville, North Carolina, rises to an elevation of 6,684 feet. The Valley and Ridge Province areas of eastern West Virginia and central Pennsylvania have rugged terrain, but the peaks are not as high as those in the Blue Ridge Province.

The Appalachian Plateau Province has less rugged but highly dissected terrain. This province includes the broad valleys of the Ohio and Kanawha River Basins. To the east and south of the Blue Ridge Province, the Piedmont Province acts as a transition area to the Coastal Plain Province. In general, the topography in all directions from the Blue Ridge Province gradually decreases in ruggedness and elevation.

(2) Land Resource Regions and Areas [1/]: Appalachia is located mainly in the East and Central General Farming and Forest Resource Region, comprising 11 land resource areas (LRA). In addition, there are 10 LRA's in other Resource Regions. Four of these land resource areas have characteristics very similar to the main Region. The other six consist of only small transitional areas on the boundary of Appalachia.

This makes a total of 21 LRA's located either partially or entirely in the Appalachian Region. Most of these LRA's follow the geographical pattern of the Appalachian Mountain Ranges; that is, they are relatively long and narrow and run in a northeasterly to southwesterly direction. See plate 1 for further details.

(3) Soils: Soils of the Cumberland Plateau and Mountains Land Resource Area (125) of Kentucky, Tennessee, and West Virginia represent about 13 per cent of the Appalachian Region. Principal soils

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1/ Agricultural Handbook 296: Land Resource Regions and Major Land Resource Areas of the U. S., December 1965.

on the hilly and steep slopes of this area are Muskingum, Dekalb, Ramsey, and Weikert. Located on the undulating and rolling plateau slopes in the north are Wellston and Gilpin soils. Generally in the south, on the smooth plateau tops and rolling foot slopes, the Hartsells, Clymer, and Jefferson soils appear. Pope and Philo, found on the flood plains and in the narrow valleys, are other important soils of this area.

Thirteen per cent of Appalachia is in the Southern Appalachian Ridges and Valleys Land Resource Area (128). This includes portions of Virginia, West Virginia, Tennessee, Georgia, and Alabama. Here the valley soils are of the Fullerton, Clarksville, Dunmore, Talbott, Colbert, Dewey, Sequoia, and Jefferson series. Soils associated with these are Decatur, Cumberland, Tellico, and Neubert. Principal soils on the steeply sloping sandstone and shale ridges are Muskingum, Berks, Lehew, Ramsey, Montevallo, and Dandridge. Alluvial soils of the Huntington, Lindside, Newark, Pope, Stendal, and Philo series are located on the narrow flood plains.

Ten per cent of the Region's soils are in the Central Allegheny Plateau Land Resource Area (126) of West Virginia, Pennsylvania, and Ohio. Muskingum and Gilpin soils are found on the steep slopes of this area. Associated with them are Upshur, Belmont, Westmoreland, and Guernsey soils. The Wheeling soil occurs on the terraces of the Ohio River. Important alluvial soils that occupy the broad flood plains of the larger tributaries of the Ohio River are Huntington and Lindside.

Ten per cent of the Region's soils are in the Glaciated Allegheny Plateau and Catskills Mountains Land Resource Area (140) of New York and Pennsylvania. Here, most of the Mardin, Volusia, and Morris soils occur on the nearly level to moderately sloping till-mantled uplands. Lordstown and Oquaga soils are found on the steeper slopes with the well-drained Chenango soils from outwash in the valleys. Major alluvial soils are Tioga and Barbour, located on the valley floors of the younger streams.

Eight per cent of the Region's soils are in the Eastern Allegheny Plateau and Mountains Land Resource Area (127) of Pennsylvania, West Virginia, and Maryland. Dominant soils on the extensive steep slopes are Dekalb, Galvin, and Lehew. The Gilpin and Belmont series are associated with these soils. On the level to rolling ridgetops, Clymer, Cookport, Wharton, and Cavode soils are found. Soils on the flood plains of the larger streams are Pope, Philo, and Atkins.

Eight per cent of the Region's soils are in the Blue Ridge Land Resource Area (130) of North Carolina, Virginia, Georgia, Tennessee, South Carolina, and Maryland. Principal soils found on the steep mountain slopes are Talladega, Chandler, and Ramsey with the associated Ash and Ranger soils. On less sloping areas, Porters soils occur in the more deeply weathered material. At lower elevations and in the more weathered material are Hayesville, Balfour, Tusquitee, and Tate with the associated Rabun and Clifton soils.

Seven per cent of the Region is in the Southern Piedmont Land Resource Area (136) of Virginia, North Carolina, South Carolina, Georgia, and Alabama. The dominant soils are Cecil, Appling, Madison, Lloyd, Enon, Georgeville, Herndon, Alamance, Mayodan, Wadesboro, and Granville. Upland soils are Davidson and Mecklenburg. They are associated on the foot slopes or wet upland flats with Iredell and Elbert. Located on the strongly rolling to steep sloped area are Louisa, Louisburg, Brandywine, and Wilkes soils.

Six per cent is in the Northern Appalachian Ridges and Valleys Land Resource Area (147) of Pennsylvania, West Virginia, Maryland, and Virginia. Dominant soils are Frederick, Duffield, Frankstown, and Dunmore from limestone; Murrill and Laidig in colluvium; and Allenwood from old glacial drift in the north. Hagerstown soils from limestone are extensive and important to agriculture. Edom and Corydon soils are important locally but of small total extent. On the slopes of the ridges, Dekalb, Calvin, Lehew, and Berks soils are important. The alluvial soils -- Huntington, Lindside, Pope, and Philo -- occur on the flood plains and are among the most important soils for crops, but their total acreage is small.

The remaining 25 per cent of the Region is divided into 13 other Land Resources Areas having the same soils or soils of similar characteristics. See plate 1 for location of the 21 Land Resource Areas in Appalachia; and for more specific information on the properties, limiting factors, and other information about the major soils of the Appalachian Region, see table XLII.

(4) Minerals: Coal is the most important mineral produced. About two-thirds of the bituminous and nearly all of the anthracite produced in the United States comes from the Region.

Other minerals that are also important to the economy are the Appalachian rocks containing petroleum, natural gas, and various metals and nonmetals. In the eastern and southern part of the Region, zinc, iron, lead, and barium are the most important metals being mined.

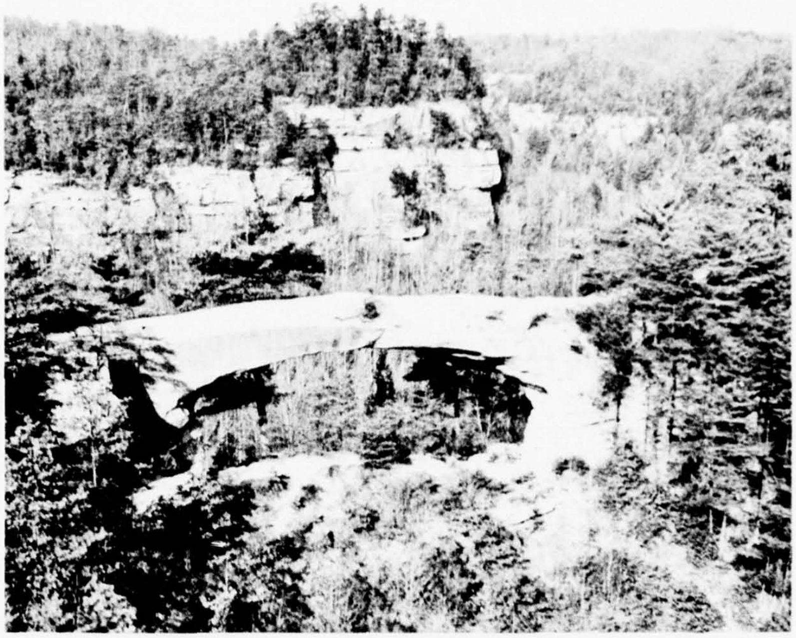
The nonmetallic minerals of importance are clay, sand, gravel, shale, sandstone, limestone, kaolin, dolomite, marble, feldspar, mica, talc, gypsum, salt, and brine. Large deposits of limestone occur frequently throughout the Region. Most of the other nonmetallic minerals occur in the eastern and southern parts of Appalachia. For complete details on minerals resources, see Appendix I -- Mineral Industry-Resources and Water Requirements.

(5) Natural features: The Region includes many areas of scenic and geological interest. A few noteworthy examples are Breaks of Sandy and Mt. Rogers in Virginia; Natural Arch and Cumberland Falls in Kentucky; Seneca Rocks, New River Canyon, Blackwater Falls, Blackwater Canyon, Spruce Knob, the Smoke Holes, and Cranberry Glades in West Virginia; Delaware Water Gap in Pennsylvania; Little River Canyon in Alabama; and Linville Gorge in North Carolina. Many caverns are found throughout the Region to invite and challenge the speleologists.

Additional examples of other outstanding natural features located within this Region are:

Roan Mountain, Tennessee and North Carolina
White Water Falls, North Carolina
The Pink Beds, North Carolina
Brasstown Bald, Georgia
Red River Gorge, Kentucky

There are a few natural lakes and many streams and rivers that make up the natural features of this Region. Portions of these rivers have unique scenic qualities that should be preserved in their natural state. The fall-line that extends through the Region results in waterfalls in the streams and rivers and provides a source of power. Since the beginning of settlement, this natural power potential has played an important part in the development of our Nation.



Stone Arch
Daniel Boone National Forest

Waterfalls enhance the scenic beauty
of the forest environment

c. Land and water resources

The total land area of the Appalachian Region is 125, 111, 400 acres. Of this total, 6, 133, 200 acres are in urban and built-up areas, water areas less than 40 acres in size and streams less than one-eighth mile wide, and federally owned land (other than National Forests and cropland). This report deals with 118, 978, 200 acres which can be grouped into four uses: cropland, pasture, forest and woodland, and other.

Water resources of the Region include both ground and surface water. Small to moderate quantities of ground water are available in most areas throughout the Appalachian Region. Large supplies of ground water are usually found in the glacial outwash and carbonate-rock areas. Surface water resources include many streams, rivers, man-made ponds, reservoirs, and a few natural lakes.

(1) Land use and soil suitability: Present land use is about 18 per cent cropland, 12 per cent pasture, 59 per cent forest and woodland 1/, 6 per cent other agricultural land, and 5 per cent nonagriculture. For details, see table I.

Land capability classes for the Region are:

Land Capability Class	Per cent
I	1
II	14
III	19
IV	14
V	Less than 1
VI	16
VII	35
VIII	Less than 1

Below is a brief description of each Land Capability Class.

Class I -- Soils have few limitations to restrict their use for any purpose. They are deep, well-drained, nearly level, easily worked, and highly productive for agricultural purposes.

1/ This does not include other federally owned forest land, such as National parks, military reservations, etc.

Class II -- Soils have some limitations that reduce the choice of plants used or require simple conservation practices.

Class III -- Soils in this class have severe limitations that reduce the choice of plants used or require special conservation practices, or both.

Class IV -- These soils have very severe limitations that restrict the choice of plants used, require very careful management, or both.

Class V - These soils have little or no erosion but have other limitations that are impractical to remove and that limit their use largely to pasture, forest and woodland, or wildlife food and cover.

Class VI -- These soils have severe limitations that make them generally unsuited for cultivation and limit their use largely to pasture, forest and woodland, or wildlife food and cover.

Class VII -- These soils have very severe limitations that make them unsuitable for cultivation and restrict their use largely to grazing, forest and woodland, or wildlife food and cover.

Class VIII -- This land has such severe limitations that it does not produce commercial or worthwhile yields of crops, forage, or wood products. Its use is restricted to recreation, wildlife, water supply, or aesthetic purposes.

In general, many of the qualities and characteristics of soils used in determining Land Capability Classes are also used for determining land use hazards for nonagricultural uses and developments, such as residential, industrial, commercial, or roads. Some general inferences can be made from Land Capability Classification for this type of development. For example, Land Capability Class I land usually presents little or no soil or topographic problem. However, Classes VI, VII, and VIII land usually present severe hazards that are costly and difficult to overcome. This is extremely important for Central Appalachia since most of the counties have from 65 to 75 per cent of their total land area in these three Land Capability Classes with many counties having 90 to 98 per cent in this category.

The Region has more forest and woodland than any other area of comparable contiguous size in the United States. Approximately 75 million acres are forested. Forest cover varies from 15 per cent in a few counties along the western portion of the Region to nearly 100

per cent in many of the mountain counties. About one-half of the counties are more than 60 per cent forested. Based on land-use patterns, plate 6 shows the per cent of forest cover by counties.

Quality of specific sites for growing trees ranges between wide extremes. The deep, well-drained, fertile soils are extremely productive. At the other extreme are the shallow, rocky soils on the dry upper slopes that are very unproductive and at times not economical for commercial timber production.

Soil properties influence the runoff from rainfall and must be considered, even if only indirectly, in methods of runoff estimation. When runoff from individual storms is the major concern, as in flood prevention work, the properties can be represented by a hydrologic parameter: The minimum rate of infiltration obtained for a bare soil after prolonged wetting. The influence of both the surface and horizons of a soil are thereby included. The influence of ground cover is treated independently.

This parameter, which indicates the runoff potential of a soil, is the qualitative basis of the classification of all soils into four groups that are used in determining hydrologic soil cover complexes which are used in a method for estimating runoff from rainfall. The classification is broad, but the groups can be divided into sub-groups whenever such refinement is justified.

In the definitions to follow, infiltration rate is the rate at which water enters the soil at the surface and which is controlled by surface conditions, and transmission rate is the rate at which the water moves in the soil and which is controlled by the horizons. The hydrologic soil groups[1/], as defined by USDA soil scientists, are:

A. (Low runoff potential) Soils having high infiltration rates even when thoroughly wetted and consisting chiefly of deep, well- to excessively drained sands or gravels. These soils have a high rate of water transmission.

B. Soils having moderate infiltration rates when thoroughly wetted and consisting

1/ Soil Conservation Service, National Engineering Handbook, Section 4, Hydrology, Part I, Watershed Planning.

chiefly of moderately deep to deep, moderately well- to well-drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.

C. Soils having slow infiltration rates when thoroughly wetted and consisting chiefly of soils with a layer that impedes downward movement of water, or soils with moderately fine to fine texture. These soils have a slow rate of water transmission.

D. (High runoff potential) Soils have very slow infiltration rates when thoroughly wetted and consisting chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a claypan or clay layer at or near the surface, and shallow soils over nearly impervious material. These soils have a very slow rate of water transmission.

Approximately 94 per cent of the soils in the Appalachian Region now in forest is classified under hydrologic soil groups B and C. Average potential moisture storage capacity in a 3-foot profile of B soils is from 17 to 21 inches, while C soils will hold from 10 to 16 inches.[1/] Figure 1 shows the percentage of forest soils by hydrologic soil groups. For additional information of major soils, see table XLII.

1/ Appalachia, Forest Resource Survey - Water - U. S. Forest Service, 1963.

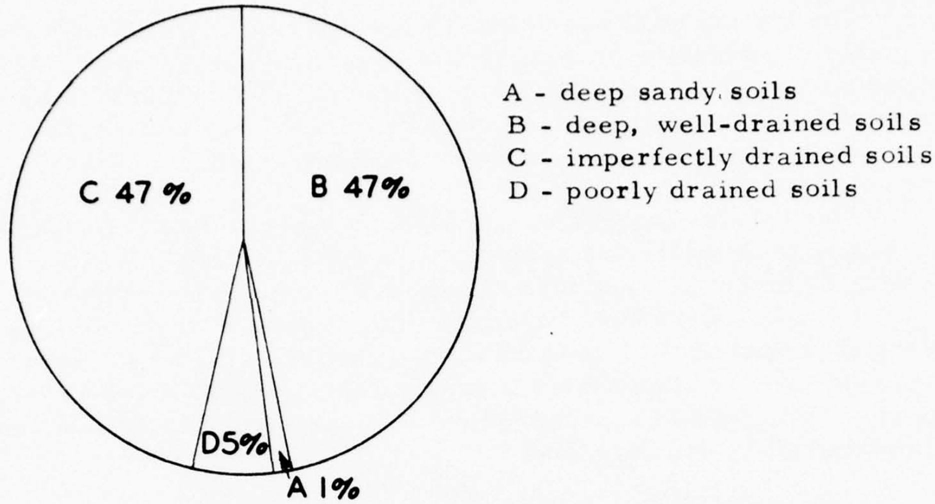


Figure 1. Forest Soils by Hydrologic Soil Groups

(2) Water use, quality, and availability: A considerable number of artificial lakes provide storage which supplements the ground water supply of the Region. Usually the quality of ground water within Appalachia is satisfactory for domestic and most other uses. Some problems do exist locally with ground water, such as iron, hardness, acidity, salinity, pollution, etc. In about 90 per cent of the Region, dissolved solid concentrations in surface waters are less than 300 parts per million. This is one of many indications that the water may require a minimum of treatment for municipal or industrial use.

The Blue Ridge Province has the least ground-water supply of the Appalachian Region. Here, yields of greater than 15 gallons per minute are generally not expected. These yields are adequate to support domestic farm and small commercial requirements.

In the Piedmont Province, the geology is more favorable for a larger supply of ground water. One of the Nation's most reliable aquifers for small yields, needed for domestic supplies, occurs in the lower part of the soil zone, the weathered bedrock, and fractures in the underlying firm rock. Scattered thin belts of limestone, marble, and other carbonate rocks provide for yields of several hundred to several thousand gallons per minute. This yield occurs only in the Piedmont Province where the precipitation, topography, and geology are favorable. In the Piedmont and Blue Ridge Provinces, the most significant factors affecting ground water yields are topography, thickness of the soil layer, and weathered mantle under bedrock.

The limestone areas of the Valley and Blue Ridge Province are capable of producing several thousand gallons per minute. This provides a dependable supply for both municipal and industrial use. In the sandstone and shale areas of the Province, only a moderate yield of 100 to 300 gallons per minute can be expected.

The Appalachian Plateau Province generally has a moderate water supply from wells and springs, with sufficient capacity for domestic, commercial, and farm needs. In northern Pennsylvania, Ohio, and southwestern New York, the glacial deposits provide large supplies of ground water. It is estimated that 642 million gallons per mile per day are available from outwash along the Ohio River in West Virginia. This yield is expected to increase as higher locks and dams are installed along the Ohio River.

In the Coastal Plain Province, the ground-water yield is considered moderate. More detailed information on ground-water resources and the physiographic provinces are contained in Appendix H -- Ground-Water Resources -- to the Report for Development of Water Resources in Appalachia.

The forest lands of Appalachia, due to location and topographic situations, generally receive a larger volume of precipitation per acre than any other land use. It is conservatively estimated that more than three-fourths of the water falling on Appalachia falls on land in forest cover.1/

According to Schneider2/, annual water yield of Appalachia averages 20 inches and exceeds 30 inches in places. Since forests occupy portions of the Region with above average precipitation, probably 24 inches is a good estimate of average yield from forest land. At this rate, the 75 million acres of forest would yield an estimated 400 thousand acre-feet or about 130,000 million gallons of water per day.

(3) Vegetation: A wide range of forest cover types occur throughout the Region, ranging from spruce and fir on the high ridges, hemlock-hardwoods and white pine on the north slopes and in the coves, maple-beech-birch in the northern Appalachian Plateaus, through the oaks and hickories of the Southern Appalachians and

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1/ Appalachia Forest Resource Study - Water - USFS, 1963.

2/ William J. Schneider and others, Water Resources of the Appalachian Region, USGS, Hydrology Atlas HA-198, 1965.

Blue Ridge, to the "piney woods" in the Piedmont and Coastal Plain. Major forest cover types, as shown on plate 5, are a classification of forest land based upon the stand composition.

The Maple-Beech-Birch Type consists of forests in which 50 per cent or more of the stand is maple, beech, or yellow birch, singly or in combination. Common associates include hemlock, elm, basswood, and white pine.

The Oak-Hickory Type is made up of 50 per cent or more of the stand in upland oaks or hickory. Common associates include yellow poplar, elm, maple, and black walnut.

The Oak-Pine Type has 50 per cent or more of the stocking in hardwood, usually upland oaks; but the southern pines make up at least 25 per cent of the composition. Common associates include gum, hickory, and yellow poplar.

Maple-Beech-Birch Type

The Southern Pine Type is described as forests in which 50 per cent or more of the stocking is made up of southern yellow pine, singly or in combination. The species are usually shortleaf, loblobby, and Virginia pine; but longleaf and slash pine stands are found in certain localities in Alabama and Mississippi. Pitch pine makes up a large part of the stands in the north.

Southern Pine

Other forest types, not shown on plate 5, because of small acreages, are spruce-fir, white pine-hemlock, aspen-birch, white-red pine, elm-ash-cottonwood, oak-gum-cypress, and cedar.

The area also abounds with many flowering trees and shrubs, such as azaleas, mountain laurel, redbud, rhododendron, dogwood, and others. In addition to flowering trees and shrubs, there is a great variety of smaller, but no less interesting and attractive plants. Over 1,300 species of trees, shrubs, and herbs, and well over 1,700 species of fungi, 300 mosses and liverworts, and 200 species of lichens are found in the Region. 1/

1/ Appalachian Forest Resource Study, Outdoor Recreation Section, USFS, 1963.

Majority of the cropland is in hay with other important crops, such as corn, truck crops, small grain, and tobacco. A normal cropping sequence is corn, small grain, and 2-6 years of hay.

Pasture land is usually covered with blue grass, white clover, timothy, orchard grass, broomsedge, little blue stem, red top, or a mixture of these and other grasses.

Unusual or unique types of vegetation occur in several areas throughout the Appalachian Region. Large areas of cactus can be found growing on the Shale Barrens located in the low foothills of the Upper Potomac River Basin in Virginia and West Virginia. The occurrence of grassy balds or open areas in the midst of heavily forested areas has never been satisfactorily explained. These areas occur above 4, 000 feet elevation and were here when the first settlers arrived. Vegetation is predominantly grasses including mountain oat grass, red top, sedge, Kentucky bluegrass, cinquefoil, sheep sorrel, violets, goldenrod, white aster, bracken fern, and mosses. There are over 80 such areas scattered from West Virginia south through North Carolina. The southern muskegs or glade areas of central Pennsylvania, western Maryland, and northeastern West Virginia have much of the same vegetation as found in muskeg areas of southern Alaska and Canada. One of the largest is Canaan Valley in southeastern Tucker County, West Virginia. The glades are characterized by a nearly continuous carpet of sphagum moss over a layer of dead, loosely compacted peat.

(4) Fish and wildlife[1/]: Appalachia is ideally suited to forest wildlife. In terms of habitat types, there are 75 million acres of forest and woodland, 1.4 million acres of permanent water, and roughly 200, 000 acres of swamps, marshes, and shallow water areas (collectively called wetlands).

There are three broad categories of forest-wildlife habitat areas. One is mostly high mountain country, heavily forested, and the least disturbed by man. Practically all of the land is above 3, 000 feet elevation. This is ideal country for black bear, wild turkey, and deer. It provides high-quality hunting in terms of prized game species and a wilderness-type environment. The area also has the most suitable water for cold-water species of fish such as trout.

1/ Forest Wildlife in Appalachia, Samuel P. Shaw, USFS, July 1963.

The second is rolling to hilly, forested country interspersed with farming. Most of the area is in the 1,000- to 2,000-foot elevation range. Deer and grouse do well in this area. Turkey is also found in the heavily forested parts where there is less human disturbance.

The third has more openland than forest and woodland. The area is relatively level to gently rolling but does have elevations over 2,000 feet in the high plateaus. Farm game, such as pheasants, bobwhite quail, doves, cottontail rabbits, and squirrels, are generally more common than forest game. Deer and grouse are found in the larger unbroken forest tracts. Fishing in the lower country is primarily for warm-water species, such as large-mouth bass, crappie, bluegill, and catfish.

Rainbow Trout Catch
Cherokee National Forest

Doe Feeding on Wildlife Food Plot

The predominantly hardwood forests of the Region are better suited to forest wildlife than the pine-dominanted forests of the Piedmont and Coastal Plain. Forest foods such as mast and understory plants, which furnish browse and other game food, are usually plentiful.

(5) Scenic beauty: A major asset of the Appalachian Region is its scenery. The wooded plateaus and mountains, picturesque valleys, pastures, and farmlands which characterize much of the Region, all combine to offer extensive areas of natural beauty. Evergreens interspersed with large areas of hardwood forests create pleasing patterns in the landscape. Changing seasons cause variations in the scenic splendor of the countryside. In spring and early summer, the redbud, azaleas, dogwood, mountain laurel, rhododendron, and many other less conspicuous flowering trees and shrubs burst into bloom. The leaves change from light green in spring, through the darker greens of summer, to a variety of leaf color in the fall. As the leaves fall, rock out-crops appear, making the ruggedness of the terrain more apparent. The addition of snow creates an entirely different appearance -- that of bleak beauty.

Farms and Mountains Meet - A Typical Appalachian Setting
of High Environmental Quality

Mount Rogers National Recreation Area
Jefferson National Forest

In its more exciting portions, the Appalachian Region boasts escarpments, sheer cliffs, rounded mountain peaks, and rock crags with waterfalls in the pockets. Natural bodies of water are few, but many man-made lakes and farm ponds dot the landscape and enhance the attractiveness of the environment.

The 5.8 million acres of National Forest Land, 4.4 million acres of other publicly owned land, and 5.1 million acres of large privately owned forests will, for the most part, maintain and enhance the scenic beauty of the Region. This is a major attraction for residents of nearby metropolitan areas. Although great natural beauty characterizes much of the Region, a long tradition of exploitation and indiscriminate methods of removing the natural resources have left many scars that will take a long time and, in many areas, large expenditures to heal.[1/]

Portions of rivers, such as the Susquehanna in New York and Pennsylvania; Allegheny and Clarion in Pennsylvania; Shenandoah in West Virginia; Potomac in West Virginia and Virginia; Big South Fork Cumberland River in Kentucky and Tennessee; Red River in Kentucky; and Chattooga in Georgia, North Carolina, and South Carolina, have outstanding scenic qualities if retained in their free-flowing state.

1/ Appalachian Forest Resource Study - Outdoor Recreation, USFS.

4. ECONOMIC DEVELOPMENT AND ECONOMY OF THE REGION

Appalachia is a region apart -- both geographically and economically. It is a mountain land boldly upthrust between the prosperous Eastern seaboard and the industrial Middle West.

Industrial cities have developed where coal, limestone, and salt occur together, as in western West Virginia, and where locally produced coal is used with imported iron ore in steel production, as in northern Alabama and western Pennsylvania. Contrasted with this are the largely rural counties of central Appalachia where the picture is primarily that of small marginal farms, abandoned or automated mines, and acute economic depression. It is obvious that the economic problems of the rural interior counties are generally more severe than those of the larger cities. However, economic conditions in these cities do not compare favorably with those of cities outside Appalachia.

a. Historical development

The Region's first settlers came inland from the coastal plantations or Piedmont area where they had learned the corn and tobacco agriculture of the Indians. This was the only kind of agriculture they knew, and they sought to establish it, first in the narrow valleys and then on the steeper slopes. Due to the topography and high rainfall, erosion soon became a problem. As a result, about two-thirds of the Appalachian cropland and pasture is now in need of conservation treatment measures.

Although there are scattered areas of productive agricultural land in Appalachia, the Region's rugged topography limits the amount of land available for use as agricultural land. In addition, such non-agricultural land uses as roads, highways, towns, cities, etc., further reduce the amount of good land that could be devoted to crop production. In addition, the mountainous topography limits the intensity of use of the agricultural land in the Region. These in part account for the lag in agricultural output as compared with the better farming regions in the United States.

Approximately two-thirds of the Appalachian Region is now in forest, primarily hardwood. Although the forest-products industry ranks a distant second after coal production, harvesting timber is big business. Much of the timber is second growth. Improved timber management practices and expected technology advances in forest-products' utilization will enable the Region to contribute heavily to the Nation's timber resources.

Coal has always been the Region's number one mineral resource. The Region has produced approximately two-thirds of the Nation's coal supply, largely bituminous coal or soft coal, for the industrial East since earliest times. The coal industry rose rapidly during World War I to a high level of development and continued at a high level throughout the 1920's. The depression of the 1930's caused a big decline in coal production. Output remained low until military production of World War II stimulated the industry to its highest peak.

A number of factors have occurred since World War II that depressed coal production again. A considerable portion of its market was lost due to competition from oil and natural gas for heating and from diesel-electric power for railroads. Automation of coal mining has displaced a large number of miners from employment. Many have remained unemployed because they were unable or unwilling to adapt or leave for other types of employment.

The best hope of the coal industry appears to be its use in electric power generators. They are already the largest consumer of coal in the United States. Appalachia also contains other mineral resources, such as limestone, crude petroleum, natural gas, sand and gravel, iron, copper, etc.; but their total combined production does not compare with that of coal in value.

When an economy such as that of the Appalachian Region is based primarily on the extraction of natural resources for its income and employment, it is extremely important that a high proportion of wealth created by extraction be reinvested locally in other activities. The relatively low proportion of native capital did not produce such a reinvestment in large sections of the Region. Much of the wealth produced by coal and timber was returned as profits to financial centers on the Eastern seaboard that provided investment and operating capital. In other cases, it was mailed to distant cities as royalty checks from non-resident operators to holding companies who had bought rights to the land for 50 cents to a dollar an acre. Even the wages of local miners returned to faraway stockholders via company houses and stores.

b. General description

Appalachia is a densely populated mountainous region, where the majority of its 17.5 million people, by almost any index of modern life, exists at a significantly lower level than the average America.

The Region has many advantages, however. Its great natural beauty gives it a potential for a growing tourist industry. It has a heavy annual rainfall, although there are few natural impoundments to store the water. It also has large coal and timber resources. More than 60 per cent of the people in the United States live within 300 miles of Appalachia. This includes the cities of Boston, New York, Philadelphia, Baltimore, and Washington on the east; Cleveland, Detroit, Chicago, and St. Louis on the west; and Atlanta and Memphis on the south. These cities have an important influence on Appalachia's economy, for they represent major markets for Appalachian products.

(1) Population: The Appalachian birth rate, for decades higher than the Nation's, dropped until it almost equaled that of the rest of the United States during the 1950-60 decade. Yet, the population of the Region grew by only 2 per cent in those years, compared to a growth of 19 per cent for the entire Nation. The Region had a net outmigration of slightly over 2 million people for the same period.

However, in 1960, population density per square mile in Appalachia was 76 per cent greater than that of the United States -- 90 as opposed to 51.

In 1960, Appalachia had 52 per cent of its population classified as rural, divided as 9 per cent rural farm and 43 per cent rural nonfarm. In 1950, it had been 56 per cent rural with 22 per cent rural farm and 34 per cent rural nonfarm. Some rural residents classified as farmers by the 1950 census were included in the rural non-farm population in 1960 because of changes in the definition of a farm. Others may have abandoned farming and either remained in their places or moved to small towns.

(2) Employment and income: In 1960, the last year for which regional data are available, there were approximately 432,000 unemployed workers in Appalachia. This represented 7 per cent of the Appalachian labor force, compared to 5 per cent unemployed in the rest of the United States.

The current deficit of job opportunities in the Appalachian Region is the result of severe employment decline in mining and agriculture. Between 1950 and 1960 these two sectors released more than one-half of their 1950 total work force. During this period manufacturing, construction, and service employment increased some but not enough to prevent a net decrease of 1.5 per cent in total employment. By contrast, there was a 15 per cent increase in employment in the rest of the United States.

In 1964, using the annual family income figure of $3,000 as an index to determine those living in poverty, one in three Appalachian families lived on an annual income of $3,000 or less. Elsewhere in the United States, that figure dropped to one family in five. Per capita income in Appalachia is 35 per cent below the national average.

(3) Social structures and current growth characteristics: The following data shows the changes in per cent of population in various age groups in Appalachia from 1950 to 1960. Percentages for the total United States and the Appalachian Region in all three groups shifted in the same direction. The per cent changes in the young and middle age groups were larger for the Nation; while in the older age group, the per cent change was larger for the Region. During the 1950-60 period, the age structure of population in the Appalachian Region tended to become more homogeneous with that for the total United States.

Distribution of Population in Per Cent by Age Group in the Appalachian Region and the United States, 1950 and 1960

Area	Less than 18 Years		18 to 64 Years		Over 64 Years	
	1950	1960	1950	1960	1950	1960
Appalachia	34.8	36.4	57.9	54.3	7.3	9.2
United States	31.0	35.8	60.8	55.0	8.2	9.2

Source: U. S. Census of Population, 1950 and 1960.

Data shows that in 1960, about 47 per cent of Appalachian people 25 years old or older had completed one to eight years of elementary school. However, there was a decrease of approximately 8 per cent below 1950. The probable reason was that a relatively large proportion of families that migrated out of the Region during that period were from this group. Meanwhile, 39 per cent of the Appalachian people 25 years or older had completed one to four years of high school in 1960, which represented an increase of 29 per cent over 1950. Eleven per cent had attended o[illegible] or more years of college in 1960 -- an increase of 26 per cent over 1[illegible]

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Education of Persons in Appalachian 25 Years of Age and Over, 1960

Item	PER CENT COMPLETING 1-8 Years Elementary School	1-4 Years High School	1 or More Years of College
Per cent of population	46.7	39.1	11.4
Per cent change 1950-60	-8.1	28.5	25.9

Source: Appalachian Data Book, Appalachian Regional Commission, 1967.

(4) Transportation: Appalachia's cities and towns, its areas of natural wealth, and its areas of recreational and industrial potential must be penetrated by a transportation network that will provide easier access to and from the rest of the Nation and within the Region. The Region's relative isolation has persisted to some extent because of the high cost of highway construction in the mountains. For example, its costs almost three times as much to build a highway in West Virginia as it does in Iowa.

Rural Forest Road
National Forests in Alabama

Interstate Highway System

There is no apparent need to expand the Region's railroad facilities. Passenger service provided has undergone a large reduction in recent years because, in many cases, it was operating at a financial loss. Also, since the trucking industry commands such a large share of the freight hauling market, it would not be profitable for railroads to expand freight service in the Region.

In addition, large quantities of freight are transported by barges on Appalachian rivers - made navigable in most instances by the installation of dams and locks. These include the Allegheny, Monongahela, and Ohio in the northern part of the Region; Kanawha, Green, and Cumberland in the central portion; and the Tennessee, Black Warrior, and Coosa Rivers in the southern part of the Appalachian Region.

Backbone for the needed transportation network is the interstate highway system, but much of the Region will not be directly served by it. A considerable amount of additional highway and road construction, such as the Appalachian corridor highway system and rural and forest roads, will be required. Air service is essential to

the economy of Appalachia. Improved and increased service could make an important contribution to the development of the Region.

(5) Urban centers and their influence: There is a lack of urbanization in some areas of Appalachia, especially the central portion, with an accompanying lack of basic community services. In those areas, dense but narrow ribbons of bleak habitation wind along the valley roads and up the tributary hollows, threading among the wooded hills. It suggests an endless town; but it is not a town, for typically there is no central water supply or disposal system, no police station or fire house, no hospital or hotel, no streets or sidewalks, and few shops or places of amusements.

The evidence is overwhelming that throughout the Appalachian Region a comprehensive approach to community programs and facilities must be undertaken. This includes such programs as regional and urban planning, housing, zoning, water supply and disposal, and control of stream and air pollution.

c. Agriculture and related economic activity

Agricultural development has not occurred on a wide scale in the Appalachian Region, mainly because of the critical lack of land adapted to mechanized farming. The lack of adequate agricultural land severely limits the production of crops requiring extensive cultivation. Much of the land is in small isolated tracts or on rough terrain which cannot be farmed efficiently with modern machinery.

Since these conditions keep the Region's agriculture at a comparative disadvantage with the Nation's better farming areas, many marginal farm operators in Appalachia have abandoned farming in recent years to seek other employment. The result has been sharp reduction in crop acreages and production. Although there has also been a slight reduction in total hay acreage, the Region still grows a proportionally higher share of the national total. Appalachian agriculture is now based primarily on livestock enterprises, with beef cattle numbers increasing by 68 per cent from 1949-64. The poultry industry has also increased sharply in recent years.

A major opportunity for farmers to increase their income from agriculture lies in further expansion of the livestock industry. The Region contains millions of acres of undeveloped potential grazing land. Its development and use for beef production over the next few years would help meet the nation's rising demand for beef. Sufficient

potential pasture land and a growing local market are available to sustain a profitable expansion of the cow-calf industry throughout the Region.

The food- and kindred-products industries experienced an employment increase of approximately 40 per cent during the 1950 decade. Substantial growth rates were evident in all state portions, with Georgia and Alabama having the highest growth rates. Activities of this group include the canning and preserving of fruits and vegetables and the processing of meats, dairy products, grain products, bakery goods, and beverages.

(1) Major crop and livestock enterprises: The following table shows that the Appalachian Region comprises approximately 7 per cent of the land area of the conterminous United States (for better comparability, all U. S. data are for the conterminous 48 states only). In 1949, almost as large a proportion of the Region was in farms as for the Nation, 60 per cent as opposed to 61 per cent. However, by 1964, the Appalachian Region had dropped to 46 per cent in farms while the United States decreased only slightly to 58 per cent.

The picture for the Region's major crops has been largely the same, with some of the sharpest acreage declines occurring between 1959 and 1964. The largest single crop from an acreage standpoint throughout the period was corn. In 1949, there was 5.8 million acres of corn in Appalachia, which accounted for 7.0 per cent of the U. S. corn acreage. In 1964, corresponding figures were 2.8 million acres and 4.4 per cent. Corn harvested for grain followed the same pattern.

Cotton, the second largest in acreage for row crops at the beginning of this period, had the sharpest decline of all crops. It dropped from 2.3 million acres in 1949 -- 8.8 per cent of the U. S. total -- to 0.8 million acres in 1964, only 5.4 per cent of the national acreage. That amounted to an acreage reduction of over two-thirds in 15 years. The Region's wheat acreage dropped off sharply from 1.2 million acres in 1949 to 0.5 million acres in 1964, but was less than 2 per cent of the U. S. total throughout the period. Oats remained fairly level at slightly over 1 million acres until 1964 when it decreased to 0.8 million acres -- 4.0 per cent of the U. S. total which, oddly enough, was larger than the 3.4 per cent at the beginning of this period.

Appalachia's tobacco acreage also held rather steady at about 15 per cent of the Nation's total during the firest three census years shown, but then dropped to 9.6 per cent in 1964. Vegetables

Corn and Tobacco

Beef Cattle Production

Total Appalachian Land Area and Major Crop Acreages and Per Cent Each is of Corresponding Conterminous United States[1/] Total, 1949-64

Land Area and Major Crops	1949	1954	1959	1964
	(acres)	(acres)	(acres)	(acres)
Appalachian land area: 2/	125,111,400	125,111,400	125,111,400	125,111,400
% of U.S. total area	6.6	6.6	6.6	6.6
% of Appalachian in farms	59.9	55.7	47.5	45.7
% of U.S. in farms	60.9	60.8	58.8	58.2
Major Appalachian Crops				
All Corn:	5,795,959	5,075,519	3,913,665	2,785,971
% of U.S. total	7.0	6.5	4.9	4.4
Harvested for grain:	5,362,960	4,514,024	3,473,372	2,152,238
% of U.S. total	7.1	6.8	5.0	4.0
Cotton:	2,338,457	1,322,567	876,265	753,428
% of U.S. total	8.8	7.0	6.0	5.4
All Wheat:	1,164,977	979,711	691,954	523,125
% of U.S. total	1.6	1.9	1.4	1.1
Oats:	1,187,298	1,303,663	1,054,889	754,756
% of U.S. total	3.4	3.4	4.0	4.0
All soybeans:	336,196	277,945	291,230	NA3/
% of U.S. total	2.7	1.6	1.3	NA
Tobacco:	224,173	218,363	167,651	98,960
% of U.S. total	14.6	14.0	15.1	9.6
Vegetables sold:	150,315	168,502	126,473	117,914
% of U.S. total	3.9	4.5	3.6	3.5
Irish Potatoes:	144,810	84,583	65,666	52,531
% of U.S. total	9.6	7.0	5.5	4.4
Orchards and Vineyards:	432,286	310,362	256,941	268,436
% of U.S. total	9.2	7.5	6.3	6.3
All Hay:	6,573,472	6,521,074	5,941,602	NA
% of U.S. total	9.7	9.3	9.4	NA
Alfalfa and Alfalfa Mixtures:	539,997	1,143,908	1,294,738	1,422,252
% of U.S. total	3.3	4.4	5.0	5.0
Clover timothy Hay:	3,567,306	2,900,396	2,712,384	2,745,855
% of U.S. total	19.2	17.1	19.3	20.5

Total Appalachian Land Area and Major Crop Acreages (continued)

Land Area and Major Crops:	1949	1954	1959	1964
Lespedeza:	1,325,608	920,345	663,477	511,522
% of U.S. total	19.1	27.9	21.5	21.8
Small grain hay:	199,179	520,195	260,692	246,589
% of U.S. total	4.1	11.1	7.3	8.8

1/ For better comparability, all U. S. data are for conterminous 48 states only.

2/ National Inventory of Soil and Water Conservation Needs, 1958.

3/ Not available.

Source: U. S. Census of Agriculture for all data except line one.

sold were highest in both acreage and per cent of the total (4.5) in 1954, but then decreased to a period low for both in 1964. Appalachia contained 9.6 per cent of the Nation's Irish potato acreage in 1949, but by 1964 only 4.4 per cent. The Region accounted for 9.2 per cent of the Nation's acreage of orchards and vineyards in 1949, but by 1959 it had decreased to only 6.3 per cent, where it still remained in 1964.

The Appalachian Region fared best in hay crops during this period from the standpoint of its portion of the national total acreage of various crops. Although all hay decreased from 6.6 million acres in 1949 to 5.9 million acres in 1959 (1964 census does not contain this item), the corresponding percentage figures were 9.7 and 9.4. Meanwhile, alfalfa and alfalfa mixtures increased from 0.5 million acres to 1.4 million acres during this period, but still comprised only 5.0 per cent of the Nation's total in 1964. Clover timothy hay was second only to corn in acreage throughout the period but experienced a considerable acreage decline. However, acreage of that crop still accounted for 20.5 per cent of the U. S. total in 1964. Lespedeza hay followed about the same trend and comprised 21.8 per cent of the national total in 1964. Although small grain hay had the lowest acreage of any hay crop, the Appalachian Region contained 11.1 per cent of the Nation's total acreage of that crop in 1954. By 1964, the Region's share had decreased to 8.8 per cent.

Major livestock enterprises are summarized in the following table.

In 1949, there were 5.9 million cattle and calves on farms, which accounted for 7.7 per cent of the conterminous U. S. total. The number increased to 7.2 million in 1964, but that represented a decline to 6.8 per cent of the Nation's total cattle. Although the Region's number of milk cows trended steadily downward to the period low of 1.8 million in 1964, its per cent of the U. S. total number remained fairly steady at about 13 per cent.

Appalachian dairy farmers sold approximately 11 per cent of the volume of whole milk in the Nation throughout the period; but their share of cream sold for butterfat, which was only 3.5 per cent in 1949, declined to 1.9 per cent in 1964. The value of milk and cream sold by the Region trended upward from $411.2[1/] million in

1/ These and all following value of sales data, including U. S. data, are adjusted by wholesale commodity price index (1957-59=100) to remove the effects of price changes between years.

Major Appalachian Livestock Enterprises[1] and Per Cent Each is of the Conterminous United States Total, 1949-64

Major Appalachian Livestock Enterprises	Unit	1949	1954	1959	1964
Cattle & calves on farms:	Millions	5.9	6.7	6.3	7.2
% of U.S. total	Percent	7.7	7.1	6.8	6.8
Milk cows on farms:	Millions	2.7	2.6	2.1	1.8
% of U.S. total	Percent	12.5	13.0	13.0	12.7
Whole milk sold:	Mil. lbs.	7,928.2	9,409.5	11,318.9	12,227.2
% of U.S. total	Percent	11.6	11.5	11.6	11.4
Cream sold for butterfat:	Mil. lbs.	20.4	14.6	5.6	2.5
% of U.S. total	Percent	3.5	3.2	2.2	1.9
Value of milk & cream sold:	Mil. dol.[2]	411.2	408.0	483.4	553.4
% of U.S. total	Percent	11.1	11.4	12.1	NA [3]
Chickens sold:	Millions	88.6	206.5	447.0	NA
% of U.S. total	Percent	15.1	21.3	27.6	NA
Chicken eggs sold:	Mil. doz.	197.4	226.1	337.3	446.2
% of U.S. total	Percent	8.2	8.5	10.2	10.4
Hogs and pigs on farms:	Millions	2.9	2.5	3.1	1.9
% of U.S. total	Percent	5.1	4.3	4.5	3.4
Sheeps and lambs on farms:	Millions	1.5	1.2	1.2	0.8
% of U.S. total	Percent	4.8	3.8	3.5	3.0

1/ For better comparability, all U. S. data for conterminous 48 states only.

2/ Adjusted by wholesale commodity price index (1957-59=100).

3/ Not available.

Source: U. S. Census of Agriculture.

in 1949 to $553.4 million in 1964. The 1959 value figure accounted for 12.1 per cent of the U. S. total -- highest percentage of any year shown (1964 U. S. data are not available).

There was a five-fold increase in the number of chickens sold, from 89 million in 1949 to 447 million in 1959 (this item is not given in 1964 census). Thus, the Region's share of the U. S. broiler market increased to more than one-fourth of total sales by 1959. Chicken egg sales also increased considerably and accounted for 10.4 per cent of the Nation's total in 1964.

The number of hogs and pigs on Appalachian farms fluctuated to a period high of 3.1 million by 1959, but dropped sharply to 1.9 million in 1964 -- only 3.4 per cent of the U. S. total. Sheep and lamb numbers trended constantly downward to a period low of only 3.0 per cent of the Nation's total in 1964.

(2) Volume and value of farm output: Corn harvested for grain production trended downward from about 163.2 million bushels in 1949 to 106.1 million bushels in 1964. The Region's percentage of the conterminous U. S. total production also declined during that period from 5.9 to 3.2 per cent. Most of the other Appalachian crops followed the same general pattern.

The volume and value of farm output are shown in the following table.

Cotton production trended constantly downward from 529.6 million pounds of lint in 1949 to 355.7 million pounds in 1964. The Region's corresponding percentages of the Nation's total production were 6.9 and 4.8 per cent in those years. Wheat, less than 3 per cent of the national total throughout, was down to only 1.2 per cent in 1964. Oats increased sharply from 34.7 million bushels in 1949 to 49.9 million bushels in 1954, but trended back down to 35.6 million bushels in 1964. The latter production figure accounted for 4.4 per cent of the U. S. total that year.

Tobacco production increased to a period high of 320 million pounds in 1954, but then decreased to the period low of 199 million pounds in 1964. In percentage of national production, corresponding figures were 16.6 and 10.0 per cent those years. Irish potatoes show a constant decrease in both production and per cent, reaching a low of 3.9 per cent of the U. S. total in 1964.

Volume and Value of Appalachian Farm Output and Per Cent Each Item is of Conterminous United States[1/] Total, 1949-64

Appalachian Farm Enterprises	Unit	1949	1954	1959	1964
Corn harvested for grain:	Mil. bu.	163.2	127.5	139.6	106.1
% of U.S. total	Percent	5.9	4.9	3.8	3.2
Cotton (linit):	Mil. lbs.	529.6	418.7	406.8	355.7
% of U.S. total	Percent	6.9	6.5	5.8	4.8
All wheat:	Mil. bu.	24.4	23.5	15.2	14.2
% of U.S. total	Percent	2.4	2.6	1.4	1.2
Oats:	Mil. bu.	34.7	49.9	45.7	35.6
% of U.S. total	Percent	3.1	3.8	4.6	4.4
Soybeans harvested for beans:	Mil. bu.	0.9	0.6	1.7	2.4
% of U.S. total	Percent	0.4	0.2	0.3	0.4
Tobacco:	Mil. lbs.	279.3	319.9	276.8	199.2
% of U.S. total	Percent	15.8	16.6	16.8	10.0
Irish potatoes:	Mil. bu.	25.5	19.3	16.7	14.5
% of U.S. total	Percent	7.0	5.7	4.4	3.9
Alfalfa and alfalfa Mixtures	Mil. tons	1.0	2.1	2.6	2.8
% of U.S. total	Percent	2.9	3.9	4.4	4.1
Clover Timothy hay:	Mil. tons	4.6	4.2	4.0	3.7
% of U.S. total	Percent	19.3	17.6	18.3	18.7
Lespedeza:	Mil. tons	1.4	0.7	0.7	0.6
% of U.S. total	Percent	17.8	26.5	19.9	20.3
Small grain hay:	Tons	0.2	0.6	0.3	0.3
% of U.S. total	Percent	6.4	10.8	8.7	8.8
Sales[2/]					
Value of all crops sold:	Mil. dol.	522.2	617.0	554.8	657.3
% of U.S. total	Percent	4.6	4.6	4.1	4.1
Value of livestock and livestock products sold:	Mil. dol.	969.7	937.7	1,242.6	1,457.8
% of U.S. total	Percent	6.7	7.1	7.3	7.8
Value of all farm product sales:	Mil. dol.	1,521.9	1,554.7	1,797.4	2,115.1
% of U.S. total	Percent	5.8	5.9	5.9	6.1

1/ For better comparability, all U.S. data for conterminous 48 states only.

2/ Adjusted to wholesale commodity price index (1957-59=100).

Source: U. S. Census of Agriculture.

Although comparatively low, alfalfa and alfalfa mixtures trended steadily upward in both production and per cent of total U. S. production. Production increased from 1 million tons in 1949 to 2.8 million in 1964. The Region's shares of national production those years were 2.9 and 4.1 per cent. Clover timothy hay production decreased from 4.6 million tons to 3.7 million tons during this period but still accounted for 18.7 per cent of the U. S. total in 1964. Lespedeza hay production dropped from 1.4 million tons in 1949 to 0.7 million tons in 1954. Nevertheless, the share of national production increased from 17.8 to 26.5 per cent during that five-year period. Production held steady at about 0.7 million tons in 1959, then decreased to 0.6 million tons in 1964, which was still 20.3 per cent of the U. S. total.

Small grain hay was highest in both production and per cent of the national total in 1954 -- 0.6 million tons and 10.8 per cent. In 1964, the Region still accounted for 8.8 per cent of the Nation's total small grain hay production.

The Appalachian Region's share of the U. S. production of most crops was usually less than the corresponding acreage share. That indicates lower yields in Appalachia than the Nation as a whole. Exceptions to that yield pattern were tobacco and small grains.

The value of all crops sold by Appalachian farmers increased from $522.2 million in 1949 to $617 million in 1954, which was 4.6 per cent of the U. S. total each year. In 1959, the Region's crop sales decreased to $554.8 million and 4.1 per cent of the national total. Although this item increased to $657.3 million in 1964, it remained at 4.1 per cent of total U. S. crop sales.

The value of all livestock and livestock products sold from Appalachian farms trended upward from $969.7 million in 1949 to a high of $1,457.8 million in 1964. In percentage of the U. S. total of that item, this represented an increase from 6.7 to 7.8 per cent during this period. Indications are that poultry and poultry products sales accounted for most of this increase.

The value of all farm products sold by Appalachian farmers increased constantly from $1,521.9 million in 1949 to $2,115.1 million in 1964. That resulted in the Region's share of total farm products sold in the Nation trending slightly upward from 5.8 per cent in 1949 to 6.1 per cent in 1964. Thus, the Appalachian Region's decline in percentage of total U. S. crop sales during this period was more than offset by its increase in the national share of livestock and livestock products sold.

(3) Employment and income: The Region's percentage of family farm workers, including operators, and number of farms are nearly the same in relation to corresponding U. S. totals. The Region's share of those two items varied between 14 and 17 per cent, approximately, from 1949 to 1959 (data for the former item are not available in the 1964 census). This indicates that from the standpoint of number of workers, Appalachia utilizes family labor in the same proportion as does the remainder of the United States, even though during the above 10-year period the number of family workers on Appalachian farms decreased by 45. 3 per cent, from 1, 191, 422 to 639, 077. The Region's highest number of hired workers -- 209, 681 -- occured in 1954, but was still less than one-fourth the number of family workers that year.

The number of farms, farm workers, employment, and income are shown in the following table.

The portion of hired farm labor employed in the Region was less than its share of farm numbers each census year, varying between 7. 7 and 8. 8 per cent of the U. S. total. The share of the Nation's regular hired workers (150 days or more annually) was even slightly smaller, reaching a low of 5 per cent of the U. S. total in 1964. This indicates less hired labor per farm in Appalachia than the national average. Also, the average amount paid for hired labor per farm using hired labor in Appalachia was less than one-half the U. S. average in all three census years for which those data are available. The Region's high for that item was $834 per farm in 1964, while the national figure was $1, 721.

Some of the more obvious reasons for the low use of hired farm labor in the Region are (1) smaller average size farms, (2) tendency toward livestock enterprises which require less hired labor, and (3) low gross income per farm.

For those same reasons the Appalachian Region contained a slightly higher percentage of the Nation's operators working off-farm than its percentage of farm numbers each census year. The most noticeable differences occur in the number of farm operators working off the farm 100 days or more annually and operators with nonfarm income exceeding sales of farm products. The Region contained over 20 per cent of the U. S. total of the latter item each census year for which data are available. In 1959, 27. 2 per cent of all farm operators with nonfarm income exceeding sales of farm products were located in the Appalachian Region. This was nearly twice the Region's share of farm numbers in the U. S.

Data on Numbers and Average Size of Farms, Farm Workers, Employment, and Income, 1949-64

Item	Unit	1949	1954	1959	1964
Appalachian farms:	No.	863, 976	747, 452	532, 692	435, 898
% of U. S. No. 1/	Percent	16. 0	15. 6	14. 4	13. 8
% of U. S. farmland	Percent	6. 5	6. 0	5. 3	4. 9
Average size farm	Acres	87	93	112	122
U. S. average	Acres	215	242	302	351
Farm Workers					
Including Operators:	No.	1, 191, 422	1, 007, 254	639, 077	NA 5/
% of U. S. total	Percent	17. 1	14. 7	13. 5	NA
All hired workers:	No.	136, 471	209, 681	130, 833	NA
% of U. S. total	Percent	8. 8	7. 7	8. 3	NA
Regular hired workers 2/:	No.	NA 5/	49, 041	51, 032	43, 632
% of U. S. total	Percent	NA	7. 1	7. 4	5. 0
Average annual Hired labor:	---				
Cost per farm 3/	Dol. 4/	NA	466	659	834
U. S. average 3/	Dol. 4/	NA	1, 104	1, 431	1, 721
Operators working off farms:	No.	388, 276	384, 756	269, 673	221, 049
% of U. S. total	Percent	18. 6	17. 9	16. 3	15. 4
100 days or more:	No.	263, 590	264, 222	196, 960	168, 968
% of U. S. total	Percent	21. 0	19. 8	17. 6	16. 7
Nonfarm income exceeding sales of farm products:	No. farms	362, 679	302, 631	266, 015	NA
% of U. S. total	Percent	23. 2	21. 2	27. 2	NA
Average gross farm income:					
Appalachian Region	Dol. 4/	1, 761	2, 080	3, 374	4, 820
Conterminous U. S.	Dol. 4/	4, 908	5, 545	8, 192	11, 070

1/ For better comparability, all U. S. data for conterminous 48 states only.

2/ Work 150 days or more annually.

3/ Average cost for only those farms reporting hired labor, not all farms.

4/ Adjusted by wholesale commodity price index (1957-59=100).

5/ Not available.

Source: U. S. Census of Agriculture.

The disparity of the Appalachian Region's agricultural industry with that of the United States as a whole is best illustrated by comparing the average gross farm income of the two. In all four census years shown from 1949-64, average gross farm income in the Nation was well over twice that in the Region. For example, in 1964, the Nation's average was $11,070 per farm while in the Region it was only $4,820.

Such disparity is not surprising after considering the fact that in 1964, typical of all census years shown, the Appalachian Region contained 13.8 per cent of the number of farms in the Nation, but only 4.9 per cent of the farmland acreage. This disproportionate ratio of farm numbers to farmland acreage in 1964 resulted in the Region's average farm size being 122 acres while the national average was 351 -- virtually three times larger. The relation of these two was approximately the same in the previous census years shown. Nevertheless, average gross farm income trended upward in the Appalachian Region during the 1949-64 period at about the same relative rate that it did in the total United States.

d. Timber resources and related economic activity

The Appalachian Region has about 75 million acres of commercial forest land[1/] on which some of the world's best hardwoods are grown. The United States is about one-third forested, and about one-fourth of the Nation is classified as commercial forest land. In comparison, Appalachia is about 60 per cent forested with 98 per cent capable of producing timber for industrial use. The Region is expected to contribute heavily to the Nation's demands for timber resources. Timber has been a mainstay of the Region's economy since it was first settled. Timber is the second largest contributor to the Region's economy among the natural resource industries. Among the manufacturing industries, lumber and woods products rank second in the number of persons employed.

A composite of the value of timber harvested in the Region in 1962, based on round wood volume and values, is estimated as:

1/ Forest land that is producing or capable of producing crops of industrial wood and not withdrawn from timber utilization by statute or administrative regulations.

Timber Products	Volume Million cu. ft.	Value Million dollars
Sawlogs, veneer logs, & Misc. industrial products	525	172
Pulpwood	278	55
Other	124	42
Total	927	269

(1) Extent and nature of resources: The present commercial forest and woodland acreage, including National Forest and other federal forest lands, is about 75 million acres. By 1975 the acreage is expected to increase nearly 3 per cent or to about 77 million acres.

Many of the counties in Appalachia are almost entirely forested. Plate 6 shows the degree of forest cover by counties in the Region.

Approximately 85 per cent of the forested area is occupied by hardwood types. The balance is in pine and other softwood types.

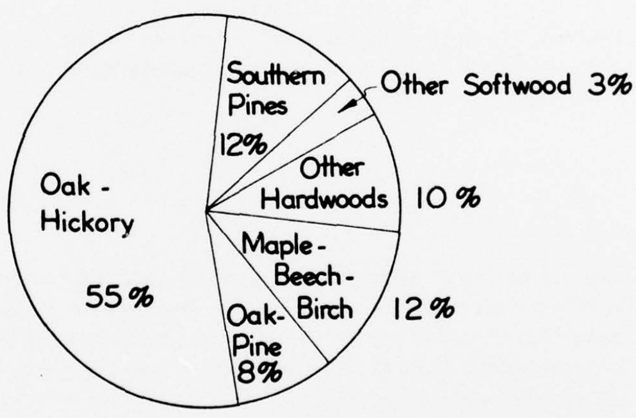

Figure 2. Major Forest Types

In 1962, almost one-half of the commercial forest land was in sawtimber stands[1/] and less than 2 per cent was classed as non-stocked.[2/] The balance was about equally divided between pole-timber[3/] and seedling and sapling stands.[4/]

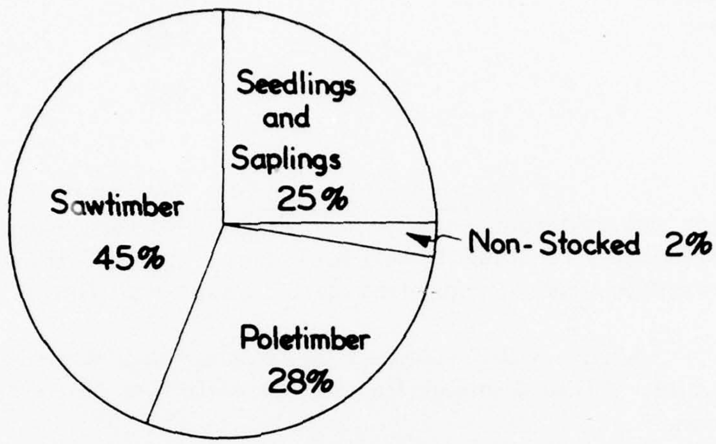

Figure 3. Timber Stand Size Classes

About 64 million acres (85 per cent) of the forest land are adequately stocked (70 per cent or more) with trees. However, only about 40 million acre are adequately stocked with growing

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1/ Stands at least 10 per cent stocked with growing stock trees, with half or more of the stocking in sawtimber or pole trees, and with sawtimber stocking at least equal to the poletimber stocking.

2/ Commercial forest land less than 10 per cent stocked with growing stock trees.

3/ Stands at least 10 per cent stocked with growing stock trees, with half or more of this stocking in sawtimber or poletimber trees, and with poletimber stocking exceeding that of sawtimber.

4/ Stands at least 10 per cent stocked with growing stock trees and with saplings and seedlings comprising more than half of this stocking.

stock trees[1] and less than 6 million acres are adequately stocked with desirable trees.[2]

Present timber volumes average less than 800 cubic feet, or 2,000 board feet per acre. The better soils are capable of supporting stands of 8,000-10,000 board feet per acre. In 1962, the total volume of growing stock was nearly 60 billion cubic feet, and the volume of sawtimber was nearly 143 billion board feet. Hardwoods comprise over 80 per cent of the volume. Volumes of growing stock and sawtimber on commercial forest land by diameter groups and by species are shown in tables VI and VII, respectively.

Although the total volume of timber is impressive, it includes a variety of tree species and qualities with limited available markets at the present. Improved local markets and technological advances will go a long way toward solving these problems. However, the present volume of timber resources alone is of limited value in appraising the usable supply of timber. A sizable portion of the existing inventory consists of small trees or species of low commercial value. Substantial amounts of timber cannot be logged because of problems of accessibility or low volumes per acre.

(2) Current and projected inventory, growth, cut, and utilization: The present inventory of growing stock, 60 billion cubic feet, is projected to 95 billion cubic feet by 2000 and to then remain fairly constant through 2020. Figure 4 shows current and projected timber inventory of hardwoods and softwoods.

The current annual growth for hardwoods is projected to decline from about 1,700 million cubic feet in 1962 to about 1,400 million cubic feet in 2000; then growth is expected to remain at about 1,400 million cubic feet per year through 2020. The current annual cut of about 600 million cubic feet is projected to increase sharply and nearly equal growth by 2000. Cut is expected to exceed growth by about 260 million cubic feet by 2020 (figure 5).

1/ All live sawtimber trees, poletimber trees, saplings, and seedlings, except cull trees.

2/ Trees that have no serious defects, have relatively high vigor, contain no pathogens, and are the trees favored in silvicultural operations.

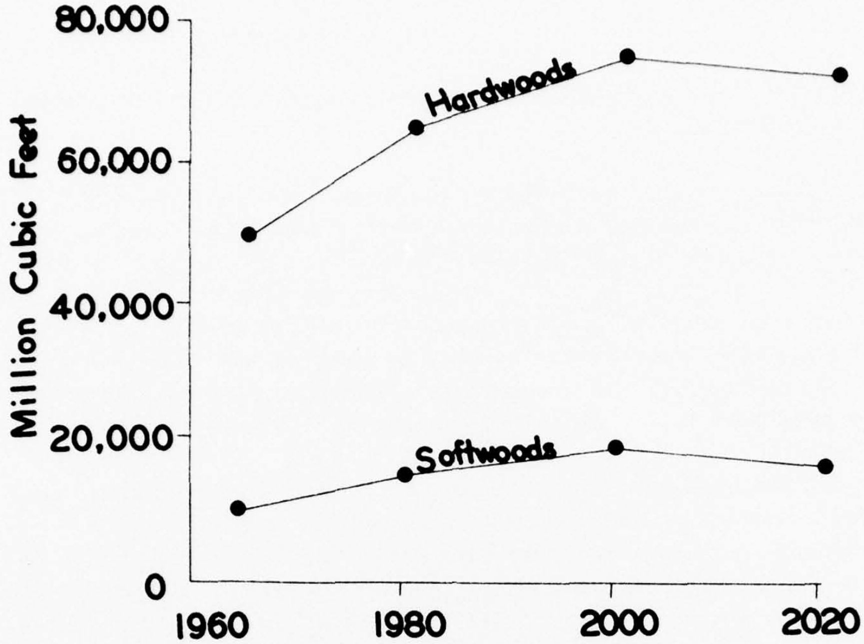

Figure 4. Timber Inventory

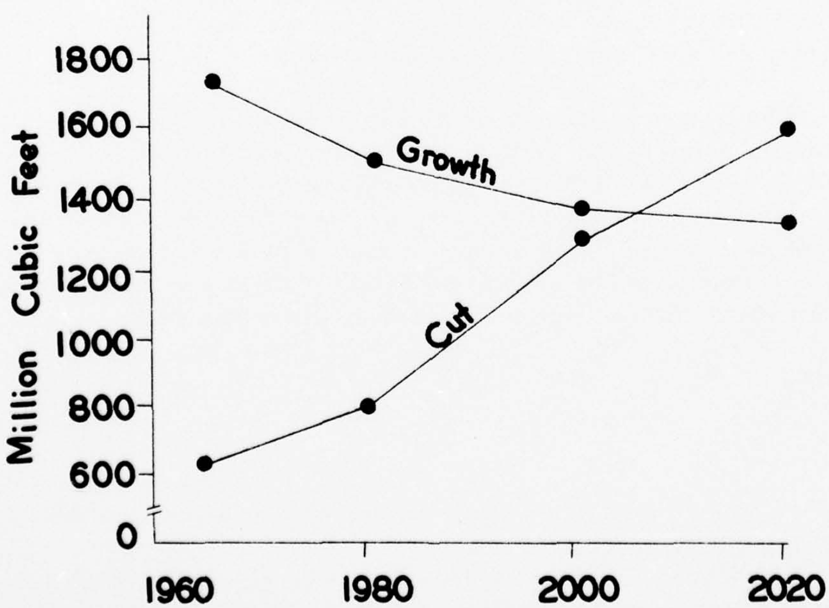

Figure 5. Hardwood Growth and Cut

Meanwhile, the current annual growth for softwoods is projected to increase gradually from about 600 million cubic feet in 1962 to a little over 800 million cubic feet in 2000; then growth is projected to continue at about 800 million cubic feet per year through 2020. The current annual cut of about 300 million cubic feet is projected to increase gradually to 1980, then rise sharply and nearly equal growth by 2000. Thereafter, the rate of cut is projected to decline but to exceed growth by about 95 million cubic feet by 2020 (figure 6).

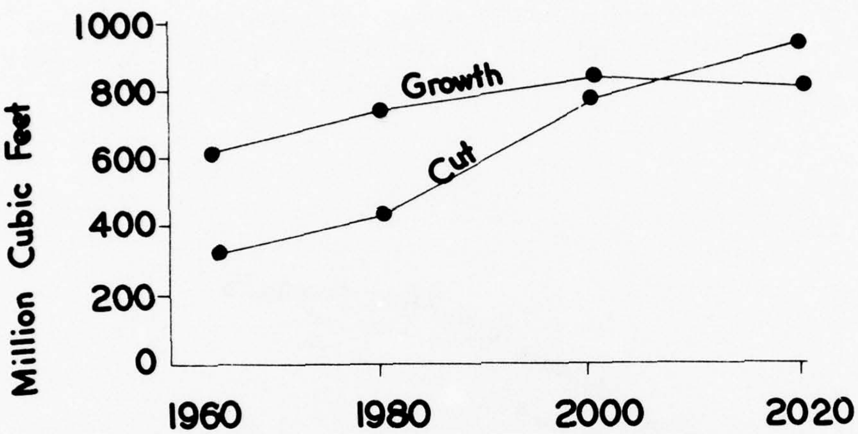

Figure 6. Softwood Growth and Cut

Cull removal, stand improvement practices, a substantial increase in pulpwood cutting, and better management are expected to hold growth nearly constant after 2000 and will improve the quality of trees on which the growth is added. Total volume of the stands will nearly double and annual cut will almost triple during the 50-year period.

Because of past cutting practices, the major portion of the cubic foot volume of growing stock is in the 10-12 inch diameter class or small sawtimber size trees. The larger diameter trees have been repeatedly cut for furniture and dimension stock during the past 70 years or more. The smaller diameter trees were cut for mine timbers during the 1930's and 1940's.

Present market demand for hardwood timber for furniture, pallets, dimension stock, lumber, paneling, cooperage, veneer, and a myriad of specialty products is strong and is expected to increase. Although softwoods are a minor portion of the timber inventory, except in the southern part of the Region, it is likely that strong markets for pulpwood and sawtimber will continue.

Figure 7 shows the projected timber products output for (1) sawlogs, veneer logs, and miscellaneous industrial products, (2) pulpwood, and (3) fuelwood.

Pulpwood production is projected to increase more than four times by 2020, but still not equal the volume output of sawlogs, veneer logs, and miscellaneous industrial products. Fuelwood production will steadily decline.

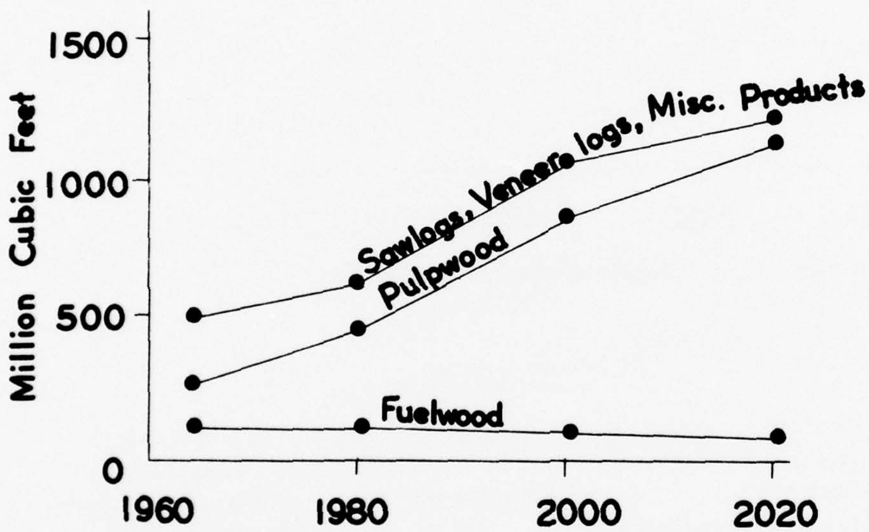

Figure 7. Volume of Timber Products Output

Figure 8 shows the estimated dollar value, in terms of 1962 average prices, of timber products delivered at the mill, other market places, or to the consumer.

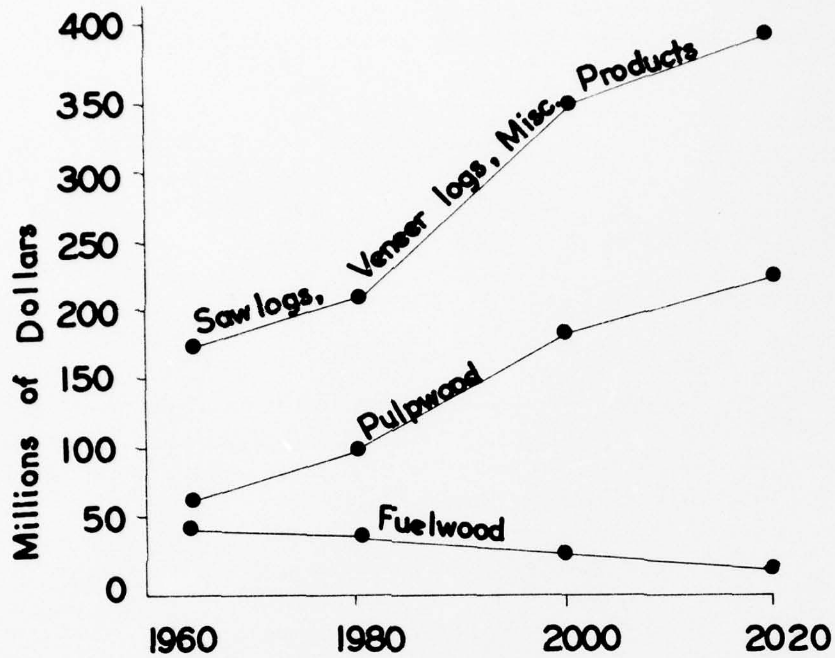

Figure 8. Value of Timber Products Output

In 1962, the total value of timber products was nearly $270 million. By 2020 the total value will increase to nearly $640 million, with over 60 per cent coming from sawlogs, veneer logs, and miscellaneous industrial products. Value of pulpwood will increase more than four times -- the greatest relative increase for any timber product. However, value of fuelwood will decrease about $20 million during the same period.

(3) Employment and income: Harvesting timber in Appalachia is big business. Cutting and hauling a billion cubic feet of timber products each year provides employment for about 48, 000 people. Most of them are self-employed or work for small, independent operators. About half are engaged in logging and trucking to nearby mills.

The estimated employment in timber-based manufacturing industries in 1962 was over 86, 000 men. This employment is projected to increase to over 96, 000 by the year 2000 and then decline to about 76, 000 by the year 2020. New developments in technology will have a very important bearing on these estimates of future employment.

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Following is the estimated employment in timber-based manufacturing industries in 1962, with projections to 1980, 2000, and 2020:

	1962	1980	2000	2020
	(thousands of employees)			
Lumber and wood products	46	41	48	38
Pulp, paper & allied products	40	45	48	38

A report, "Appalachia's Forest Resources - Timber," prepared for the President's Appalachian Regional Commission in September 1963, pointed out the opportunity for expanded employment through development of the timber resources as follows:

> In 1962 the number of unemployed males in rural areas of Appalachia was estimated at over 170,000. Most of these men are equipped only for work requiring comparatively limited skills. Timber resource development needs offer opportunities to put many of these people to work at useful jobs that they are capable of performing. The development work that could be accomplished in the next few years would, in turn, generate a much larger source of employment in future years as timber crops mature and the base for wood-using industries is strengthened.
>
> Reforestation, timber stand improvement, access road construction, and marking of property boundaries are major items of timber development work needed. Others, such as fencing to protect valuable or potentially valuable timber stands from grazing; construction of firebreaks; erosion control in overgrazed areas; and new and existing logging roads; and development of recreational opportunities on both public and private lands are needed to support and enhance the major timber development work. Nearly 40,000 man-years of employment will be needed to accomplish these jobs. This employment is

Upstream Watershed Development Used for Flood Protection and Recreation
George Washington National Forest

Winter Recreation - Skiing

in addition to the substantial employment already taking place in these activities and in the more readily recognized phases of the timber industry.

e. Outdoor recreation and related economic activity

Appalachia has the potential and is ideally located to provide outdoor recreational opportunities to the densely populated eastern half of the country. Over 42 million people live within 90 miles of the Region with about two-thirds of the entire population of the country living within 500 miles. 1/

However, accessibility is an important factor affecting the participation of urban population in outdoor recreation activities. With a more efficient highway system, the scenery, land, and water resources would become more readily accessible. The proposed Appalachian Highway System will greatly improve access to land and water resources of the Region and enhance the possibility for developing outdoor recreation facilities in rural areas.

The Region inherently has many of the essential natural features needed to make possible high quality outdoor recreational opportunities, such as fresh air, open spaces, and great forests. Clear water and abundant wildlife are also available. Forest-based and much of the water-based recreation has developed because historically when man needed mental relaxation, emotional release, spiritual rebirth, or relaxing physical exercise, he has gone to the woods. During recent years, people with more intense mental stresses of city life, leisure time, income, and with more comfortable and faster automobiles on better highways have created a rapidly increasing demand for forest and water-based recreation.

Nearly 13.4 million acres of public and private land and more than 1.4 million acres of water provide a tremendous resource potential for outdoor recreation. Of the total water area, 1.1 million acres are in large impoundments. The remaining 300,000 acres consist of private lakes, farm ponds, and 50,000 miles of stream. However, only one-fifth of the total stream mileage is suitable for recreational use. About 115 million acres of potential wildlife habitat land are available. 2/

1/ Appalachia's Forest Resource - Timber - USFS.
2/ Appendix F -- Recreation and Aesthetics.

A major use of water is for such outdoor recreational activities as boating, fishing, hunting, and swimming. It is estimated that over 4 million sportsmen presently harvest over 100, 000 white-tailed deer, 25, 000 turkeys, and 1, 100 black bear annually. There are an estimated 5 million squirrels, 4 million rabbits, 300 thousand grouse, and 50 thousand woodcock harvested each year. In addition, it is estimated that a total of 38 million pounds of sport fish are caught annually.[1/]

Developed types of recreation such as camping, picnicking, swimming, and boating, are enjoyed by thousands of visitors to National Forests each year. Dispersed types of recreation, such as hiking, horseback riding, wilderness camping, hunting and fishing, and bird watching, are becoming increasingly popular. The demand for these types of recreation will increase many fold.

Landowners and operators cooperating with their soil and water conservation districts are providing many outdoor recreational opportunities. As of July 1, 1967, income-producing recreational enterprises installed on farms amounted to 3, 107. Also, approximately 160, 735 farm ponds have been constructed which have incidental use for recreation and fishing.

USDA upstream watershed projects completed and authorized for installation and operation as of July 1, 1967, include multiple-purpose structures for recreation and fishing. These developments will provide 11, 250 acres of surface water and adjacent land area for basic recreational facilities. An estimated 1, 383, 000 recreation-days[2/] annually will be provided by these projects. For a summary and location of recreational multiple-purpose developments in authorized projects, see tables XXVI and XXVII and plate 4.

The 175 completed and authorized upstream watershed projects, as of July 1, 1967, include 1, 177 single-purpose flood prevention structures. The permanent sediment pools have considerable value and are being used for incidental recreation. Recreational use and public access to these structures vary considerably and according to the easements provided. Almost all, however, are pro-

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1/ Forest Wildlife in Appalachia, Samuel P. Shaw, USFS.

2/ A standard unit of use consisting of a visit by one individual to an outdoor recreation development or area for recreational purposes during any reasonable portion or all of a 24-hour period.

viding recreational opportunities at least to families and friends of the owners of the sites.

With careful planning and further development by landowners and operators and local, State, and Federal agencies, the existing resources could provide considerable additional outdoor recreational opportunities.

The continued construction of farm ponds and flood control and recreational reservoirs will increase water acreage for fish production. Increased pollution control, restoration of strip-mined areas, and land treatment will also improve and increase fish and game habitat areas. Singularly or in combinations, these changes and improvements will help satisfy the pressures for hunting and fishing in the future.

In Appalachia, recreational opportunity has largely been provided by developments on publicly owned lands, National Forests, National Parks, Tennessee Valley Authority reservoirs, U. S. Army Corps of Engineers reservoirs, and state parks and forests. The demand for this type of recreation will continue to increase.

To illustrate the importance of the forest land for outdoor recreation, in 1966 about 10.5 million visitor-days' use (1 visitor-day = 12 visitor-hours) were recorded in the National Forests within the Region. Using an assumed value of $2[1/] per visitor-day use, its present recreational value is estimated at $21 million per year. By 2000, the number of visitor-days to these National Forests is expected to increase eight or more times.

Since the National Forests occupy only 8 per cent of the total forest land, private landowners, who now control over 65 million acres or 85 per cent of forest land, must adjust their land management to meet the expected demands in outdoor recreation and its effect on the economy of the Region. State and local governments must also manage their forest lands for increased recreational use.

1/ ORRRC Report No. 24, 1962, Economic Studies on Outdoor Recreation.

5. PROBLEMS AND NEEDS OF RESOURCE DEVELOPMENT FOR ECONOMIC GROWTH

a. Land use and treatment

Present and expected land use by Water Sub-Regions is shown in table I of this report. These figures are from the National Inventory of Soil and Water Conservation Needs (CNI) taken in 1958 and National Forest data.

The 1958 CNI shows that by 1975 there will be 9, 268, 800 acres of cropland in Appalachia with the dominant problem of erosion needing treatment. The type of measures needed are those that will reduce and slow runoff and soil losses. Cropland on which excess water is the dominant problem is expected to be about 2, 351, 600 acres by 1975. Unfavorable soil conditions will be the dominant problem on an additional 511, 300 acres. There is also expected to be about 1, 005, 300 acres of cropland due to the limiting natural capabilities of the soil which should be converted to less intensive use such as pasture, woodland, and wildlife land. Land treatment needs for cropland by Water Sub-Regions are shown in table XXXIV.

Pasture land treatment needs by 1980 include pasture planting on about 4, 855, 800 acres and improvement of vegetative cover on another 5, 133, 900 acres. Protection from overgrazing and invasion of undesirable plants is needed for an estimated 2,887,600 acres. Treatment needs for pasture and grassland by Water Sub-Regions are shown in table XXXV of this report.

Surface strip-mining for coal has left vast acreages without adequate vegetative cover. It is estimated that of the area stripped for coal production in the Region about 634, 200 acres have not been reclaimed. This not only causes critical erosion and stream sedimentation problems but also acid pollution of streams.

Erosion damage in the Appalachian Region includes deterioration of the soil and its productivity on agricultural and forest lands. In addition, there is loss of soil from roadbank cuts and fills, strip-mine spoils, and during new construction.

Sediment is a product of erosion and a major concern in water pollution. It greatly exceeds in volume the combined total of all the other substances that pollute surface water. In terms of volume, such suspended soils in the nation's streams amount to at least 700 times the loadings caused by sewage discharge. Virtually

Streambank Erosion

Roadbank Erosion

all of the phosphate and pesticides carried by streams is attached to sediment particles.

Sediment is a costly water pollutant. It constitutes a heavy economic drain in terms of loss of valuable top soil, obstructs navigable streams, fills natural channels resulting in increased flooding and drainage problems, damages aquatic life, and imposes a substantial cost on water supply agencies for water clarification. Increased costs also result from excess wear on hydro-power turbines and pump impellers.

Based on studies in the Potomac Basin and other comparable studies, the deposition of sediment is depleting the storage capacity of reservoirs in the Region at the rate of about 70,000 acre-feet each year.

Sediment affects every citizen. It means higher water bills, higher food and clothing prices, and higher taxes. Estimates indicate it is costing the people of the Region in excess of $39 million annually.

The efficient use of land and water with the establishment of necessary conservation treatment and management measures is essential for economic growth in the Appalachian Region.

b. Forest management and development

Most of the forested area is contributing less than its full potential to the economic growth and welfare of the Region. Improved protection and management are needed to realize this potential and to provide high-quality, better regulated runoff.

A regionwide study, in which the forest lands on more than 100 upstream watersheds were surveyed and analyzed to determine their ability to infiltrate, percolate, and store precipitation, indicates that approximately 55 per cent of the forest land is in poor hydrologic condition 1/, 27 per cent in fair, and 18 per cent in good hydrologic condition. The following tabulation gives a reasonable picture of the present hydrologic condition by Water Sub-Regions:

1/ Hydrologic condition is the relative ability of specific combinations of soil and vegetative cover to absorb precipitation and retard runoff.

Sub-Region	Present Hydrologic Condition (Thousand Acres)		
	Poor	Fair	Good
A	1,500	400	100
B	3,200	3,600	3,500
C	600	500	100
D	2,800	700	300
E	12,100	2,900	1,300
F	2,400	3,500	2,400
G	6,600	4,200	3,200
H	800	700	600
I	2,800	1,100	500
J	7,600	2,100	1,600
Total	40,400	19,700	13,600

The study shows that poorly planned timber cutting, improper logging operations, poorly engineered and constructed logging roads, land clearing, livestock grazing, and uncontrolled fires are the primary reasons why over one-half of the forest land is in a poor hydrologic condition. The results have been:

1. Loss of productive organic matter and topsoil.
2. Increased susceptibility to flash flooding.
3. Low quality or polluted water.
4. Loss of many miles of beautiful streams and adjacent land for recreational use.
5. Damages to wildlife habitat and fisheries.
6. Loss of timber production.
7. Loss of aesthetic values.

The following tabulation illustrates the present average annual soil loss from forest lands by Water Sub-Regions:

Sub-Region		Present Erosion* (Tons by Year)
A		662,000
B		2,897,000
C		2,346,000
D		4,166,000
E		10,907,000
F		3,534,000
G		14,480,000
H		3,065,000
I		5,260,000
J		12,718,000
	Total	60,035,000

*Computed using Musgrave's soil loss production formula.

At the present time, timber growth is about double the volume cut; but because of poorly planned harvest, losses to fire, grazing, insects, and disease, residual stands are generally low in quality. The growth is only a small part of the potential production that is possible. Substantial amounts of otherwise merchantable timber cannot be logged because of problems of accessibility and/or low volumes per acre.

Major problems in attempting to get good forest management practiced by landowners have been their lack of time and long-term investment money and low and delayed returns. This is true for both public and private forest ownership. The bulk of forest land is in small private ownerships averaging less than 50 acres in size. An increasing amount of forest land is owned by absentee landowners, many of whom seldom visit their land except for hunting or an occasional week-end. The long-term investment needed to improve forest conditions simply is not available or is invested in other opportunities with quicker returns.

Many landowners are not equipped, do not have sufficient labor, and/or do not have the proper skills to carry out the needed forest land treatment measures. Even with Federal cost-sharing, it is obvious that the workload of needed treatments will not be accomplished at the present rate. Further incentive is needed, possibly through increased Federal cost-sharing. This would help reduce the landowner's need for long-term investment money. However,

it still leaves his other problems of lack of time, labor, equipment, and skills. A possible solution to these problems would be through the organizing and equipping of full-time work crews. They would be employed, trained, equipped, and supervised by State forestry organizations, Soil Conservation Districts, or private contractors. The work crews would work under contract to landowners and provide the labor, skills, and equipment needed in installing land treatment measures. Participating landowners would be required to protect the area treated from fire, pests, and grazing and follow approved forest management and cutting practices.

Ownership of commercial forest land is shown in figure 9.

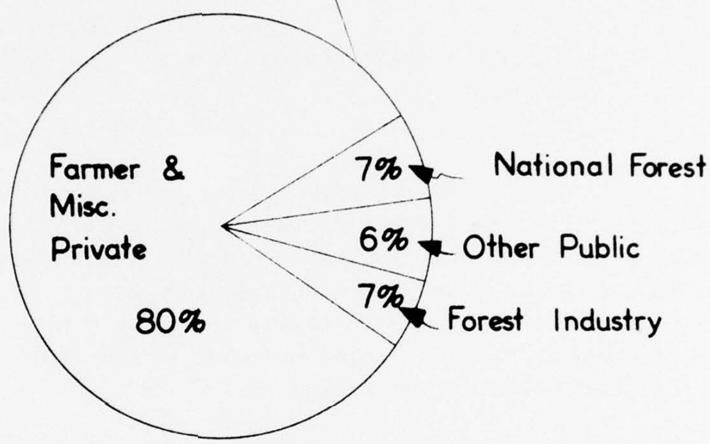


Figure 9. Ownership of Commercial Forest Land

Multiple-use forest management must be adopted on private forest lands if the basic economy in the mountain and plateau areas is to develop along with that of the urban area. Wood, water, wildlife, recreation, and scenic beauty must all receive recognition in management objectives. Some land will not be used to its full potential for a single purpose to give the greatest dollar return or the greatest unit output. The goal should be the most judicious use of the land for some or all of these resources and related services to meet the needs of the people.

To improve and maintain forest land (both public and private) the following measures and assistance are needed:

1. Hydrologic cultural operations: Included are forest type conversion, thinning cuts, weedings, improvement, salvage and properly conducted harvesting cuts. Such operations

improve forest hydrologic conditions through increase of litter, development of humus, and maintenance of adequate vegetative cover. All measures taken to alter the type and amount of vegetative cover such as converting brush to grass, trees to grass, and understory removal can be employed to effect timing of water yields. It is estimated that about 45 million acres need this treatment.

2. Tree planting: Acreage of farmland has been decreasing, a trend that is expected to continue. Some of this results in idle land that returns little or no income to the owner or community. This land is often subject to erosion and often detracts from the natural beauty of the Region. About 10.6 million acres of open and forest land need to be reforested for more productive use and to reduce runoff and erosion.

3. Woodland grazing control: Exclusion of livestock improves hydrologic conditions by preventing soil compaction and damage to tree roots, seedlings, and other ground cover. Preventing this damage allows a litter and humus layer to build up, providing optimum conditions for good infiltration and storage of water in the soil. It is estimated that exclusion of livestock is needed on about 8 million acres.

Woodland Severely Grazed

Erosion Problems Created by Improperly Constructed
and Maintained Logging Roads

4. Erosion control: Abandoned logging roads, skid trails, eroding streambanks, and other critically eroding areas not properly maintained are primary sources of rapid runoff and sedimentation. Many of the roads and trails which have not revegetated naturally become channels for both surface and subsurface runoff, causing extensive erosion. It is estimated that about 1.8 million acres need stabilization through vegetative and/or structural measures.

5. Technical forestry assistance: To the landowner to plan and install measures outlined above. This involves the preparation of 23,150 individual management plans and stimulation of landowner interest and participation in the program.

6. Forest protection: Continued forest fire protection and insect and disease control are essential to derive maximum benefits from watershed protection and management practices. Time limitations precluded a complete study of fire prevention and control needs for all states in the Region. However, an accelerated fire protection program is badly needed on about 3.6 million acres of a 12-county critical fire area in southwestern West Virginia. Acceleration of fire control facilities is needed on National Forest lands.

Insects and diseases causes significant losses in commercial hardwoods. These losses include tree mortality, growth loss, and reduction in quality and grade. Although present knowledge of hardwood insects and diseases is limited, these losses can be reduced. Efforts to determine the biology of these organisms and their impact must be accelerated by research and control agencies.

7. Land ownership development: Private forest land will be counted on in the years ahead to produce larger shares of forest resources for the Region. Yet, many small forest ownerships are inefficient operating units or ineffectively located to practice forest management as a major enterprise. Also, many acres of private forest land have been strip-mined and have not been adequately reclaimed. The job of protecting and developing the thousands of acres of forest land in small private ownerships is tremendous, and development is difficult because motivation and cooperation of the landowners are directly involved. Private landowners who have not changed forest management practices over the past half century are experiencing depleted resources, low incomes, persistent unemployment, and substandard living conditions.

Small ownerships within boundaries of public forest land create many problems for forest managers due to the many fragmented tracts, blocked access, illogical boundaries, timber trespass, and other similar situations that raise cost and reduce efficiency in forest management. A program of public acquisition by states, Federal Government or other governmental units should proceed where development and management will not otherwise be accomplished. 1/ Over a 10-year period, it is estimated that 2.7 million acres should be acquired for public use and protected and developed for maximum sustained yield of all forest resources.

c. Floodwater damages and flood prevention

The floodwater damage to upstream watersheds in the Appalachian Region is usually caused from high-intensity storms and flash runoff. Channel obstructions, lack of flood prevention structures, and poor hydrologic condition of the land greatly contribute to flooding.

1/ Appalachia's Forest Resources - Timber. President's Appalachian Regional Commission, 1963.

A high percentage of the floods occur during the growing season. They occur on the average of two to four times a year. Damages from flooding are to row and truck crops, pasture, woods, public roads, railroads, bridges, urban centers, farm roads, fences, livestock, and farm buildings.

Flooding can cause several weeks' delay in planting and harvesting crops. This tends to lower yields or may destroy the entire crop. The economic impact to an area from severe flooding generally causes a decline in the agricultural economy, which is never recovered.

Based on the 1967 Conservation Needs Inventory for Watersheds, the total average annual floodwater damage in upstream watersheds of the Appalachian Region is $94.8 million. Of this amount, $24,446,000 occurs in watersheds studied to November 1, 1967. Tables XXVIII-B, XXX-B(3), XXX-C(3), XXX-E, XL-C, and XLI-C summarize $20,335,600 of these damages. The remaining $4,111,000 occur in the Potomac River Basin. This total floodwater damage occurs to an estimated 5.2 million acres of agricultural land and 234,200 acres of urban areas. This represents over 82 per cent of all land in the Region which is presently subject to flooding and about 4.5 per cent of the total land area.

The reduction of present and future floodwater damages by upstream water resource developments is essential to encourage and attain economic growth in the Appalachian Region.

Reduction of flood damages to crop, pasture, and forest land encourages and permits land to be used more intensively and within its natural capability. Profits are greater due to yield increases, less replanting, and lower per unit harvesting costs.

The reduction of flood damages to other agricultural properties is a saving of operation and maintenance expenses to the farmers. The benefits from reduced damages to transportation facilities are direct benefits to all people.

Crop and pasture damages from flooding in upstream watersheds studied to November 1, 1967 are estimated at $10,268,700 annually.

Damages from sediment occur to drainage and irrigation ditches, equipment, and facilities. The cost can include the clean-out and maintenance of the channel, which, if not done, results in the reduction of crop yields and income.

The economic effect of erosion and sediment is the loss of crops, increased production cost, and reduced income. For recreation, it means a loss in fishing, hunting, and other recreational and scenic values.

Also, there are extensive damages to railroads, farm roads, and highways. The additional cost for sediment removal eventually falls on the local economy. There may also be considerable damage to municipal and industrial water supplies. The major cost is for additional treatment and greater replacement of machinery due to wear by sediment. The total damage amounts to an estimated $631,200 annually.

Flood damages to other agricultural property, such as farm roads, buildings, fences, machinery, and livestock, for these watersheds are estimated at $754,000 annually. This loss is a tremendous burden on the individual farmers, not only in lost income but also in additional expenses for replacement of machinery, livestock, etc. This places a further strain on the local agricultural economy.

Transportation facilities, such as roads, railroads, bridges, and culverts, receive damages estimated at $2,902,800 annually. These losses are considerable, and the expense of replacement or repair results in an additional burden on the local economy. These expenses are generally met through increased rates and property tax assessments.

The urban floodwater damages in upstream areas are estimated at $7,754,500 annually. This is particularly serious since most development, because of the steep topography of upstream areas, is and must occur on the narrow flood plains. This tends to discourage development and growth. To a large extent, this damage falls on the individual property owner. Some owners have sufficient resources to clean up, repair, and continue to live in their homes and operate their businesses. There are others who lose their life savings, homes, and businesses, and must depend upon others for their rehabilitation and livelihood.

These devastating floods not only destroy entire homes and businesses but also contribute to extensive damage to houses, garages, lawns, gardens, fences, sidewalks, cars, household furnishings, and business merchandise. Floods also interrupt the operation of many industries, putting people out of work and causing losses in wages and salary income.

Urban Flooding

Road and Bridge Damage

The total impact of flood damages on the local economy of an urban area is almost incomprehensible. The tremendous cost of building new homes, businesses, schools, and churches, the task of cleaning up debris, sediment, and litter, and the refurnishing of homes and restocking of merchandise is a drain on the local economy which may take several years to recover. Overall, under these conditions it is almost impossible to attract new industry so vital for the economic development of the growth areas.

Other economic aftereffects of urban damages are the loss of wages when industries and businesses are closed down; the increase in taxes after the flood to pay for cleanup by the city, county, and state; and the raising of rates by utilities to offset the losses they sustain.

Indirect damages generally include the interruption and detouring of traffic due to roads being flooded or damaged, the interruption of public utility services resulting in loss of food in freezers and of perishable agricultural products which cannot be stored or brought to market, the loss of income to business, the expense, hardship, and inconvenience of people flooded out of their homes. This damage is estimated at $2, 135, 500 annually.

Although these damages may not occur after each flood, when they do occur it causes a significant impact on the local economy.

d. Drainage

Studies indicate there are 3,592,700 acres of cropland in the Appalachian Region that have not been properly drained. Acres of cropland needing drainage and feasible to drain by capability sub-class (w or wet soils) in the Appalachian Region are as follows:

Land Capability Sub-Class	Needing Drainage	Feasible to Drain	Per Cent of Total
IIw	1,561,100	955,000	61
IIIw	1,774,600	1,286,800	73
IVw	257,000	109,800	43
Total	3,592,700	2,351,600	65

Source: 1958 National Inventory of Soil and Water Conservation Needs.

This land has the natural inhibitory factor of wetness; and, although it is presently in crops, 65 per cent should be drained for more profitable crop production. The remaining 35 per cent of the cropland would not respond to drainage sufficiently to make it economically feasible. About 916,000 acres or 39 per cent will require project-type action to efficiently correct the problem.

Drainage of cropland in capability sub-classes other than IIw, IIIw, and IVw is not recommended.

The potential benefits from drainage and associated management are summarized by Water Sub-Regions in table XXXVIII. There are presently 2,351,600 acres of cropland in the Appalachian Region that will respond to drainage sufficiently to make it economically feasible. Besides yield increases from drainage, there will be additional yield increases from associated management, such as more timely planting, cultivation, and harvest.

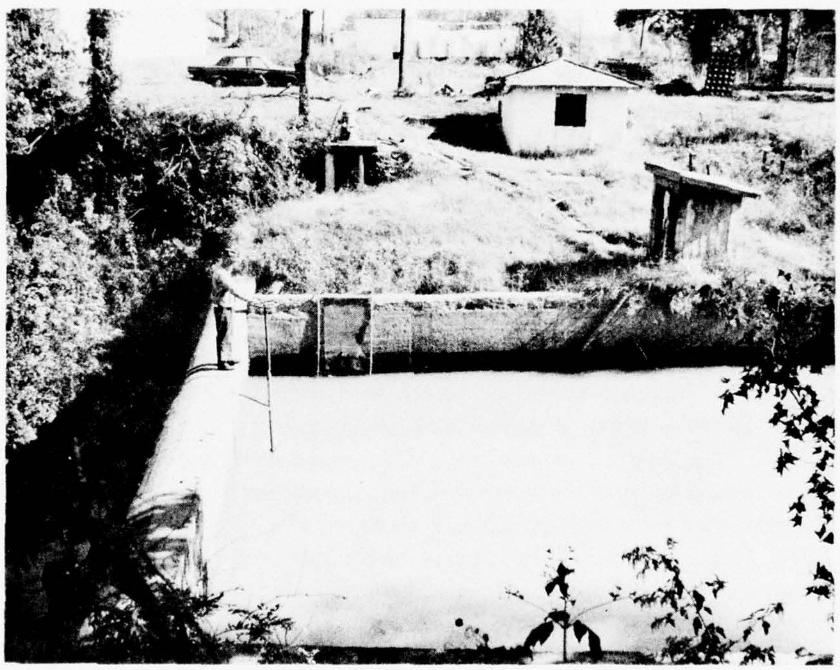
e. Water supply and quality

Rural water supply is a problem in many upstream areas in the Region. The problem involves present and future domestic water needs, including fire protection. The recently completed 1967 CNI for Watersheds shows that a little over 37 per cent of the upstream watersheds will require some project—type action to meet these needs.

The municipal and industrial water supply problems, including quality, availability, treatment, and distribution, are extensive in some of the upstream watersheds and rural communities of the Appalachian Region. Shortage of water can have a tremendous detrimental impact on the local economy. Water supply, both quantity and quality, is a major consideration in selecting a location by some industries. This has kept industrial development to a minimum and greatly slowed economic growth in many parts of Appalachia.

Needs for industrial and municipal water supply were reported by many communities and determined from studies made by the Federal Water Pollution Control Administration. Many of the identified problem areas are located in or adjacent to upstream watersheds studied in this survey. The 1967 CNI for Watersheds shows that in upstream watersheds of the Region over 24 per cent have water problems relating to municipal and industrial water supplies. An acceleration of upstream water resource developments with storage for this purpose is an absolute necessity for future economic growth of the Region.

Water quality problems are numerous throughout the Appalachian Region. There is a great need for additional storage for water quality management to augment low stream flow. One problem concerning water quality in the upstream watersheds results from low base stream flow during summer and early fall months. The problem is further aggravated and complicated by acid mine drainage, untreated or insufficiently treated industrial and municipal sewage, and sedimentation resulting from eroding watersheds and construction sites. This contributes to an already depressed local economy and makes economic growth difficult, if not impossible. The 1967 CNI for Watersheds shows that almost 49 per cent of upstream watersheds has the problem of water quality management. Water quality management needs have been studied by the Federal Water Pollution Control Administration. See Appendix D -- Water Supply and Water Pollution Control for more details.



Inadequate Water Supply Reservoir

Sediment Damage and Pollution Problem Caused By Mining Operations

In the Appalachian Region, water supply for fish and wildlife resources is excellent in some areas and almost nonexistent in others. This lack of water in some areas is due to low stream flow during the late summer and early fall months and the extremely limited number of natural and man-made impoundments. The 1967 CNI for Watersheds shows almost 60 per cent of the upstream watersheds have a need to improve or increase the fish and wildlife population through water resource developments. The total effect on the local economy is harmful and compounded. This results when local people spend money traveling outside the area to hunt and fish, as well as the loss of income from sportsmen who would be attracted from outside the Region to hunt and fish. Many industries will not locate in areas where outdoor recreation facilities are not reasonably close. This has also slowed economic growth of several areas.

The opportunity to increase fish and wildlife resources is excellent. Use of additional storage in the upstream water resource developments to maintain stream flow and provide additional surface

water for fishing and hunting would be a big factor in attracting people from outside the Region. The influx and expenditures by people from outside the Region has a particular beneficial effect on the local economy. Appendix G -- Fish and Wildlife prepared under this survey gives more details on this subject.

Although there has been an increase in the number of farm ponds used for irrigation, water supply has generally not been a limiting factor restricting irrigation in Appalachia. The limiting factors are such items as high capital investment in irrigation equipment, topography, lack of good agricultural land, and low net returns.

Since Appalachia is a high rainfall region, irrigation practiced is supplemental in type and subject to fluctuations of weather conditions. For example, a series of dry years will stimulate interest in the practice and considerable expansion of irrigated acreage results. However, it is primarily on small plots of high-value specialty crops, such as tobacco, truck crops, orchards, and tree nurseries, and is more of an emergency measure than a standard practice. Conversely, in years of adequate or surplus rainfall during the growing season, the irrigated acreage usually declines. This is borne out by the reduction in irrigated acreage in the Region from 1954 to 1959 as shown in table XXXIX. However, the 1967 CNI for Watersheds shows an estimated 147,400 acres suitable for irrigation in the upstream watersheds requiring some type of project action because of inadequate supply or distribution systems, or both.

Recent, unpublished research by the Economic Research Service indicates that only modest returns can be expected from irrigation of field crops on the average farm under average weather and soil conditions in Appalachia. This probably accounts for the general lack of interest in irrigation. However, irrigation is expected to show a gradual upward trend in future years, especially for high-value specialty crops produced under intensive management and on soils with limited water-holding capacity.

f. Recreation

Water-oriented and -related recreational needs far exceed the supply in most of the Appalachian Region. The 1967 CNI for Watersheds shows a little over 57 per cent of upstream watersheds have need to improve or develop water-oriented recreation facilities. Demand for recreation is increasing and more and more people are turning to nonurban areas for satisfaction of recreation wants. Participation rates at public and private outdoor recreation areas are

exceeding anticipated levels. Recreation demand is expected to triple or quadruple by the year 2000.

The deficiency of recreational opportunities is due mainly to lack of impoundments, inadequate stream flow, polluted waters, as well as insufficient development of recreational facilities. As a result, many people in certain areas of the Region go elsewhere to participate in recreational activities. This causes a loss of income to the local economy, not only from people within but also from people outside the area.

The greatest demand and largest needs in terms of activity-days by 1980 for the Region will be for swimming facilities. Second in magnitude will be picnicking, third boating, and fourth camping. There must be an increase and enlargement of present facilities or construction of new developments to meet the future demands for recreation. The physical requirements and opportunities in the Region for upstream water resource developments to provide storage for recreation is almost unlimited. In many areas of the Region such developments represent the best, if not the only, chance to improve the local economy.

With the present level of development, the recreational resources can support almost 90 million recreation-days annually. The present demand totals 281 million recreation-days. To meet present additional needs, 600,000 acres of impounded water will be required for boating; 20,000 acres of land for camping; and 30,000 acres of land for picnicking. For present fishing needs, more than 140,000 additional acres of surface water are required. With proper management these needs could be met by the acres required for boating.

Projected demand is estimated to be 491 million recreation-days by 1980. The projected 1980 needs without any additional developments will require 1.5 million acres of impounded water for boating, including almost 145,000 acres for fishing, and 150,000 acres of land must be developed for camping and picnicking. More detailed problems on recreation are covered in Appendix F -- Recreation and Aesthetics, made under this survey.

Recreational developments are needed on public lands to highlight natural attractions through trails, overlooks, impoundments, and other developments. Recreational opportunities within the 15 National Forests include impoundments, facilities for public use, and special projects such as Mount Rogers and Spruce Knob-Seneca Rocks National Recreation Areas. These developments are set forth in more detail in Appendix F -- Recreation and Aesthetics of this survey.

The large number of private ownerships within public land boundaries is often a limiting factor in developing good recreational sites. Broken land patterns often make it difficult or impossible to fully develop some sites. An accelerated public land purchase program is necessary if the opportunity for utilizing these sites for public recreation is not to be lost. Potential sites for development of swimming facilities, for example, are scarce.

State and Federal lands alone can not hope to supply opportunities for all people seeking outdoor recreation. Suitable sites on private lands must also be developed. Tourist attractions and accommodations should be encouraged.

National Forests in Appalachia experienced a 30 per cent increase in hunting and a 32 per cent increase in fishing between 1950-60. Main reasons for the increased hunting and fishing pressure on the National Forests are:

1. Large areas of accessible land.

2. Better managed wildlife habitat.

3. Increased posting of private lands.

The increase in demand for hunting and fishing opportunities is expected to continue. One problem for land managers is attainment of proper distribution of hunters and fishermen. Limited funds have prevented extensive fish and wildlife habitat development of National Forests as well as of private lands to permit better hunter and fishermen distribution.

Development of habitat, including food plots, ponds, food and cover shrubs, openings and stream improvements, and habitat surveys are needed to meet present and future hunting and fishing demands. The estimated needs for National Forests alone are approximately: 2.8 million acres of game habitat analysis; 84,000 acres of forest wildlife openings; 40,000 acres of food plots (seeding and planting); 22,000 acres of forage plant release; 45,600 acres of stream and lake surveys; 1,900 acres of small water impoundments including waterholes, potholes, waterfowl impoundments, and others. Public lands can never meet all the hunting and fishing demands. Incentives must be provided to make it profitable for the private landowner to supply hunting and fishing opportunities for the general public.

Construction of transportation facilities, other than interstate routes and connecting links, has not been adequate for developing the recreation, fish and wildlife, and other forest resource potentials of the Region. Conservative estimates are that nearly 6,600 miles of new roads and trails and related facilities are badly needed within the National Forests to open areas for recreation, better distribution of hunting and fishing pressures, and for management and protection of other forest and water resources.

g. Pollution and pollution control

Pollution problems in the upstream areas of Appalachia are numerous and widespread. Sources most widely recognized are industrial, municipal, acid mine drainage, sediment, organic chemicals, oil, and recreational. Pollution from industrial sources arise from disposal of waste matter, both organic and inorganic, into lakes, streams, and other water areas. This is generally caused from lack or inadequate treatment of effluent before discharging into streams.

During coal mining operations, the iron and sulphur-bearing materials are exposed to the air and water. With water and air, oxidation transforms these substances into ferrosulphate and sulphuric acid. This causes pollution and makes the streams useless for fish and wildlife. Also, it discourages new industry from locating near these streams; therefore, it denies the Appalachian area of new industries.

An acceleration of industrial and municipal pollution control is necessary to encourage economic growth in the Region. This can be accomplished by greater treatment and development of new treatment technology. Where low stream flow is a water quality problem, additional storage is possible in most of the upstream water resource developments.

Soil erosion and consequent pollution of surface water by sediment is one result of uncontrolled runoff. Excessive erosion occurs on mismanaged agricultural and forest lands, spoil from mining operations, construction projects, and other areas where vegetative cover is severely disturbed or lacking. Sediment causes excessive wear on equipment and increases treatment cost for public water supply. Sedimentation of streams, lakes, and ponds adversely affects aquatic plant and animal growth and the biologic balance.

Acceleration of land treatment measures for all agricultural and forest land, especially on critically eroding areas such as strip-

mine spoils, are essential to reduce pollution from sediment and acid mine drainage. Additional measures are needed to control or prevent detrimental washings from refuse piles resulting from coal mining and steel and other manufacturing processes; control runoff and sediment from construction of expanding urban areas with particular attention to modifying methods of land clearing, grading, and street construction; control of runoff and sediment during the vast new highway construction program; and control of inorganic waste resulting from agricultural and industrial production.

Organic chemicals (farm fertilizers and insecticides) have occasionally contributed to fish and wildlife kills when used improperly. Better control and information on proper use of chemicals in agricultural and forest production must be developed to reduce any chance of detrimental effect on fish and wildlife.

Leakage and spills during the production and transportation of oil causes pollution. In addition, salt water usually associated with oil production is a major cause of pollution in some areas.

Pollution can affect the temperature, color, taste, and smell of water and surrounding area. Water can be offensive aesthetically but not necessarily a danger to health, while other water may look harmless but be dangerous to humans, animals, and plant life. The pollution of swimming areas will cause the areas to be unsafe or so repulsive as to lose all its recreational value.

Thermal pollution, either from industrial sources or from stream management practices, can raise the temperature of the water above the point that game fish can endure, thus reducing or eliminating fishing as a recreational input into the economy of an area. It is becoming a key problem on the marginal trout streams in Appalachia. The maximum water temperature that any species of trout can endure is approximately 70 degrees. The scrappy little brook trout can tolerate stream temperatures up to a maximum of 67 degrees. Therefore, along those streams that approach the southern limits for trout, special measures should be taken to maintain and enhance the fishery. These include leaving or developing both high and low shade along the bank as the stream traverses open areas such as pastures or croplands; preserving streamside strips during logging operations; installing cold water release features in any structures installed; and avoiding or eliminating other elements, such as overflow from shallow ponds, that might raise the temperature of water in trout streams by even a small amount during hot summer months.

Economic impact from pollution includes impairment to health, increased cost for water treatment, loss of recreational uses, and depreciated property values. It is also a definite detriment to industrial development and economic growth.

h. Employment and income

Resource-oriented problems affect employment to a considerable extent. Employment in agriculture and mining is declining. Agricultural employment in 373 of the 397 counties of Appalachia dropped from 773,000 in 1950 to 375,300 in 1960. Employment in mining decreased from 475,100 to 198,500 during the same period. These employment figures show a loss of 674,300 jobs over a 10-year period. A similar comparison of employment losses for other industries shows Appalachia's losses proportionally greater than those for the Nation.

This decline in employment in these resource-oriented industries has released a large supply of labor which has been available for employment in other industries. Job opportunities have been scarce in the Region, resulting in large-scale unemployment and out migration.

The high rate of unemployment has contributed to the low per capita income levels common to the Region. Average incomes might be even lower were it not for the large number of migrants from the Region.

Water and related land resource development can contribute to present and future employment and income of the Appalachian Region. Increases in income resulting from more intensive land use and treatment, flood prevention, drainage, irrigation, recreation, and improvements in water supply and quality can help to increase and stabilize both employment and income.

In the agricultural sector of the economy, an increase in farm production can result in larger incomes to processors of farm products and operators of farm-supply businesses as well as farmers. Increases in employment can also result but are less likely because of the high rate of underemployment in the Region. Stabilization of the economy through reduction of year-to-year variations in agricultural production may be as important as the increases in average income over time.

In forest-based industry, the two problems which apparently influence employment are: (1) relatively low skill levels of the

unemployed labor force, and (2) the predominance of older workers resulting from the migration of younger workers from the Region. Training will be needed to develop the skills required by timber industries. Labor in the higher skilled class is probably more readily trained for new jobs in industry than labor in the lower skilled classes. However, the employment opportunities that will develop through planned accelerated land treatment programs will be best fitted to the lower skilled classes.

Additional water resource development can create more job opportunities and could contribute to the economic growth necessary to meet the benchmark projections of the Appalachian Water Resource Survey.

i. Economic growth

The economic benchmarks set by the Appalachian Water Resource Survey represent goals for the economic growth of the Region. If attained, they would mean a reversal of the long-time downward trend of the general economy of the Region and an economic growth rate well above the national average. Agriculture would remain an important industry in the Region's economy, even through it would account for a smaller share of the total than at present. Volume and value of production of forest-based industry is projected to more than double.

The attainment of benchmark projections will require each sector of the economy to contribute to the economic growth of the Region. Water and related land resource development will be needed if agriculture and forestry are to contribute their optimum shares of the economic growth.

In some locations where wood supply is adequate, lack of an adequate supply of high-quality water prevents establishment of a wood-pulp industry. In other locations, lack of nearby sources of pine pulpwood is a handicap for mills manufacturing paper requiring at least 20 per cent pine pulp. Many timber stands cannot be used for industrial purposes at present because of isolation or remoteness from transportation facilities. Lack of quality timber presents problems for industries with exacting requirements in dimensions and quality.

Development of private timber resources is a key element of the public effort that is needed in Appalachia. To achieve real and lasting improvement in the timber-based sector of the economy, much better organization and management of the privately owned timber resources and more efficient processing and marketing facilities are needed.

Section 204, Timber Development Organizations (TDO's), of the Appalachian Regional Development Act of 1965 authorizes a new approach to private forest land management problems. Federal, State, and private efforts should be combined and coordinated to develop efficient non-profit corporations to deal with all aspects of local timber growing, harvesting, and marketing in a multiple-use framework. Other existing programs can also be used effectively to assist private efforts. Work crews could be organized, equipped, and trained to carry out the resource development projects initiated through TDO's.

Increases in agriculturally related employment and income can result from resource development. Such increase will help to produce a favorable rate of general economic growth. There must be other resource development in the Region if there is to be a revival of economic growth.

6. EXISTING RESOURCE DEVELOPMENT PROGRAMS

The U. S. Department of Agriculture administers many programs aimed at conserving, developing, and using our natural resources. These programs have grown over the years and now constitute a major portion of the Federal plan for flood control, irrigation, water supply, recreation, rural electric power, and other related purposes.

a. Rural areas' redevelopment and outreach functions

Under Presidential Executive Order No. 11307 which made facilities of the USDA field agencies available to assist other Federal agencies in extending their programs into rural areas, USDA organized Technical Action Panels (TAP) in every state and rural county or area in Appalachia. The panels include a representative from each of the USDA agencies providing service in rural areas under the leadership of the Farmers Home Administration. Objectives of these panels are to:

1. More effectively extend services and benefits of Federal and State agencies to rural communities, groups, and individuals.

2. Assist rural individuals and communities to identify needs and locate and secure needed services and programs.

3. Provide assistance in rural communities to plan economic development and community projects and keep plans current by updating needs, inventories, and goals.

4. Encourage and assist local leaders in forming rural development organizations and citizen committees for community resource developments.

5. Encourage and assist citizen committees in formulating and updating community development plans.

6. Provide assistance to regional, state, district, areas, and county planning bodies to assure the maximum utilization of human and natural resources to benefit rural areas.

b. PL-46, SCD, RC&D, FHA, ASCS, FES, and REA programs

The Soil Conservation Act (Public Law 46 - 74th Congress) was approved April 27, 1935. This Act directed the Secretary of Agriculture to establish a permanent agency in the U. S. Department of Agriculture. This agency was to be known as the Soil Conservation Service. Public Law 46 formally recognized soil erosion as a "menace to the national welfare" and that erosion could be controlled. It gave this agency the responsibility of developing and carrying out a long-range program to protect, improve, and safeguard all agricultural lands.

The National Cooperative Soil Survey is the basis for most programs dealing with land use and treatment, including protection, improvement, development, and management. The Soil Conservation Service has primary Federal responsibility for this survey. The Forest Service is conducting soil surveys on lands which they administer. Public planning and zoning agencies, developers, engineers, and others use soil survey information for planning nonagricultural land use. As of July 1, 1966, a total of 79,837,400 acres, or 64.0 per cent of the Appalachian Region, has been soil surveyed and mapped.

Soil Conservation Districts (SCD) are a source of help and information about soil and water conservation. Each district is self-governed. They are legally constituted units or instrumentalities of state government and operate under the general guidance and supervision of a State Soil and Water Conservation Commission or Committee. U. S. Department of Agriculture's Soil Conservation Service channels most of its on-the-land technical assistance to landowners and operators through soil conservation districts. Various other USDA conservation and related natural resource programs are carried out in cooperation with these districts.

A number of state legislatures have amended their district laws to include the word "water" in the district name -- Soil and Water Conservation District. There are 317 local soil and water conservation districts in the Region. All but one of the 397 counties in the Region are in organized districts. Districts sponsor or co-sponsor most watershed protection and flood prevention projects and resource conservation and development projects. With their "district program," they develop emergency and long-range programs for their area. They provide a means by which communities can coordinate programs of all State and Federal conservation and natural resource agencies.

The Food and Agriculture Act of 1962 authorized formation of Resource Conservation and Development Projects (RC&D). These projects are aimed at speeding up and coordinating resource activities over broad areas, usually in a number of counties. They make possible a unified approach in meeting local resource problems and improving local economy by developing and utilizing land, water, forest and woodland, and wildlife resources. These projects are locally initiated and sponsored. The Soil Conservation Service has been given USDA administrative responsibility and leadership for this program. They provide technical and other assistance, along with the Forest Service and other agencies. Project measures can be divided into four general groups:

1. Land treatment measures, which include land management practices proposed in the development and installation of a sound conservation program.

2. Structural measures, which may include developments within an authorized watershed project or other public development.

3. Associated measures, which include facilities necessary for processing, marketing, and utilizing products from the area's natural resources.

4. Supporting measures, which include developments, or enterprises, necessary to meet the project objectives, but which are primarily the responsibility of organizations and agencies outside the U. S. Department of Agriculture.

In the Appalachian Region, as of June 30, 1967, there were seven RC&D projects planned and authorized for operations. These seven projects are:

Project Name	State	No. of Counties	Total Development Area (Sq. Mi.)
Coosa Valley Area	Ala.	4	2,620
Gwinnett	Ga.	1	437
South Central	N. Y.	7	5,789
Penn Soil	Pa.	3	2,372
Hull-York Lakeland	Tenn.	11	4,029
Little Kanawha Area	W. Va.	5	1,778
Mountain Dominion	Va.	3	2,046
	W. Va.	2	

See plate 3 for location.

The Farmers Home Administration (FHA) makes direct loans to individuals for operating credit and farm purchase, enlargement, or development. Loans are made to help apply conservation measures, including income-producing recreational facilities carried out as part of a basic conservation plan. Loans and grants are made to groups or municipalities for planning and development of community water and sewer systems.

The Agricultural Stabilization and Conservation Service (ASCS), through the Agricultural Conservation Program (ACP), offers cost-sharing for installing approved soil-building and soil and water conserving practices.

The Federal Extension Service (FES) is part of the cooperative extension service partnership. Three levels of government -- federal, state, and county -- share in financing, planning, and implementing extension education programs. Extension Service acts as the education agency of USDA. Extension specialists work with other agencies to provide local people information relating to soil and water conservation and other agricultural programs. This work has been an integral part of USDA since 1914.

Rural Electrification Administration (REA) administers rural electrification and rural telephone programs which have significant bearing upon the management and development of water and related land resources. Rural electric cooperative systems in Appalachia, numbering approximately 100 and operating rural electric facilities representing an investment of about $400 million, have a vital interest in the hydroelectric aspects of this water resource survey.

c. Agricultural and forest research programs

Agriculture Research Service (ARS) carries out agricultural soil and water conservation research within the USDA. This includes research on soil and crop management and water management on farms relating to crop production. Both lines of work are conducted cooperatively with State Experiment Stations, Land Grant Colleges, and other agencies.

The Economic Research Service (ERS) collaborates with most State Agricultural Experiment Stations, Land Grant Colleges, and other government agencies in conducting research in cost and returns of various farm enterprises in the respective states. In addition, ERS makes economic base studies of the agricultural economy of entire regions for use in detailed regional resource development planning.

The Forest Service is conducting research in many phases of forestry which will have significant influence on the economy and other aspects of life in Appalachia. Of primary interest to the present study is the research in watershed management and strip-mine reclamation. Relationships between the forest and all aspects of water resources -- erosion, water quality, floods, and water supply -- are being studied at the Parsons Timber and Watershed Laboratory in West Virginia, at the Coweeta Hydrologic Laboratory near Franklin, North Carolina, and at the Forest Hydrology Laboratory at Oxford, Mississippi. Emphasis is on condition and improved management of forest land. Personnel for a project on management of storm runoff is headquartered at Columbus, Ohio with a field installation at Dover, in Tuscarawas County, Ohio.

Forest Service research on strip-mine reclamation is headquartered at Berea, Kentucky; a sub-project is located at Kingston, Pennsylvania. Studies include improved methods of mining to reduce on-site and downstream damages, reclamation after mining by mechanical means, and establishment of woody and herbaceous vegetation. The approach is a cooperative one in association with states, universities, and mining associations.

Research is also underway on forest products marketing and utilization, forest economics, timber management, forest engineering, wildlife habitat, and recreation. Research in forest products marketing and utilization is conducted at Athens, Georgia and Princeton, West Virginia. Research in the economics of timber growing is conducted at Columbus, Ohio and study of regional

Contour Strip Farming

Revegated Strip-Mined Area

production economics is in progress at Upper Darby, Pennsylvania. Timber management projects are located at Warren, Pennsylvania; Parsons, West Virginia; Berea, Kentucky; Asheville, North Carolina; Sewanee, Tennessee; Athens, Georgia; and Blacksburg, Virginia. Forest engineering research is headquartered at Morgantown, West Virginia. Wildlife Habitat Research is also underway at Morgantown, Blacksburg, and Warren. Research on forest recreation is conducted at Asheville, North Carolina and Syracuse, New York.

In addition, a comprehensive study of timber resources is periodically updated throughout the Region. This has been intensified under the Appalachian Regional Development Act to facilitiate economic development, and special analyses have been made of timber production.

d. Upstream watershed programs

The Flood Control Act of 1936 (Public Law 738 - 74th Congress) was approved June 22, 1936. This Act delegated responsibility to both Secretary of the Army and the Secretary of Agriculture to carry on a national program of flood control. The Act specifically included authority for the U. S. Department of Agriculture, under the direction of the Secretary, to conduct investigations and apply measures for runoff and waterflow retardation and soil-erosion prevention on specified watersheds.

Under the Flood Control Act of 1944 (Public Law 534, December 22, 1944, 78th Congress, 2nd session), the U. S. Department of Agriculture was authorized to apply special treatment for flood control on 11 watersheds in 12 states. Four of these 11 authorized watersheds lie partly in the Appalachian Region. They are the Upper Potomac River in the states of Maryland, Pennsylvania, Virginia, and West Virginia; Upper Coosa River in Georgia and Tennessee; Little Tallahatchie River in Mississippi; and the Yazoo River in Mississippi. The area involves a total of about 9.7 million acres, with 5 million acres in the Appalachian Region.

As part of the Agricultural Appropriation Act for fiscal year 1954 (Public Law 156 - 83rd Congress, approved July 28, 1953), funds were appropriated to start demonstrations of combined soil conservation and flood control work in 50 or more watersheds under the basic enabling authority of Public Law 46 (74th Congress). The Soil Conservation Service was assigned the responsibility for approving the areas to serve as pilot watersheds and for helping local groups with technical phases of the work.

Planning and operations were started in 60 small watersheds in 34 states. The pilot-watershed program was designed to test and demonstrate the practicability of treating the complete watershed by the application of land treatment and structural measures to alleviate damages from floods, silting of reservoirs, impairment of stream channels, and other upstream land and water resource problems.

There are seven pilot-watershed projects completed in the Appalachian Region in six states. Two projects are in Kentucky and one each in Georgia, New York, Pennsylvania, South Carolina, and West Virginia.

These pilot watersheds played an important part in demonstrating the many benefits of the complete watershed approach, opportunities for multiple-purpose use, and working with individuals and local groups to achieve conservation objectives.

The Watershed Protection and Flood Prevention Act (Public Law 566 - 83rd Congress) was approved August 4, 1954. This law is administered by the Soil Conservation Service with assistance from the Forest Service. The law authorizes the U. S. Department of Agriculture to provide technical and financial assistance to local people in upstream watersheds to develop and install a comprehensive program to preserve and develop their land and water resources. These programs will also help meet the demand and needs of the watershed for economic growth and expansion. A watershed program can include:

1. Watershed protection and management measures to improve soil cover and reduce soil and water losses.

2. Flood prevention and control to protect people, property, and productive land from flood damage.

3. Water storage for agricultural, domestic, municipal, industrial, and water quality management purposes.

4. Land stabilization measures to protect valuable land or property.

5. Drainage to protect crops and property.

6. Development or improvement of outdoor recreational and fish and wildlife opportunities.

The Upstream Watershed Program is a local, State, and Federal partnership. There are four unique features of this program. First, the people within the watershed must start any upstream watershed program by requesting assistance in writing, listing water and land resource problems and their desires for development. No upstream watershed project can be initiated by the Federal Government. Second, the program must include necessary land treatment and management measures to improve, protect, and maintain the basic natural resources. Third, it is the only project-type Federal program which requires the development of a physically and economically sound plan of improvements for land treatment and structural measures to be installed over a definite period of time. Fourth, final formulation of the program is made by people in the watershed. Their decision is based on alternatives and possibilities for full potential development as pointed out during the joint planned process.

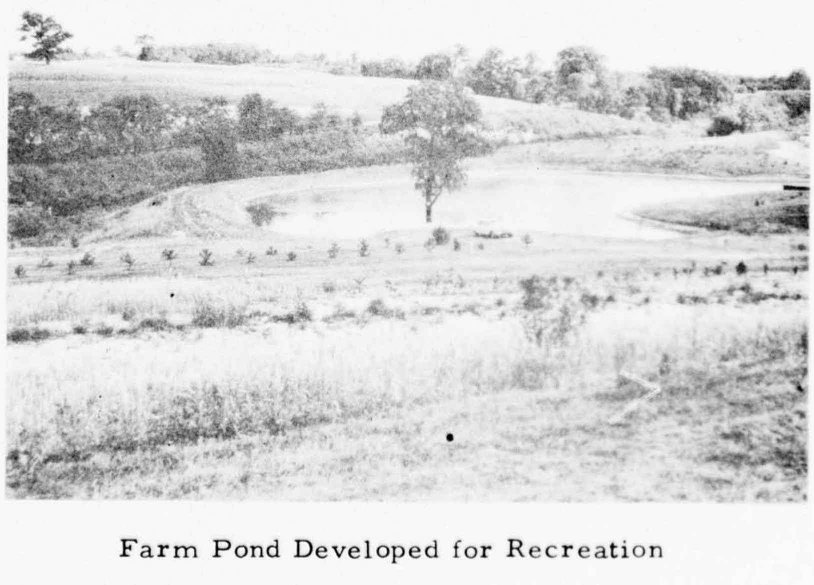
The Upstream Watershed Program provides an opportunity for local initiative and leadership in meeting watershed problems and development of land and water resources. USDA and State forestry agencies provide technical and financial assistance for planning and installation of the program. People in the watershed arrange for necessary easements, rights-of-way, and operation and maintenance costs for the structural measures. They must also assume a portion of the cost allocated to purposes other than flood prevention. This portion of the cost varies with the intended purpose. It is truly a local program with Federal and State assistance.

As of July 1, 1967, there were a total of 175 upstream watershed projects completed and/or authorized for installation covering 9.8 million acres or about 8 per cent of the Region. Of the total there were 36 watershed projects with all planned works of improvement completely installed. The remaining 139 watershed projects are in various stages of installing the planned works of improvement.

The 36 upstream watershed projects completed in the Region include 134 structures and land treatment measures. Those structures contain 6,700 acre-feet for sediment storage and 67,190 acre-feet for flood prevention storage. Eleven of the structures are multiple-purpose.

The 11 multiple-purpose structures in the 36 completed watershed projects contain 2,975 acre-feet for storage for municipal and industrial uses, 270 acre-feet for recreation with 22 surface acres, 5,851 acre-feet for fish and wildlife with 755 surface acres, and 550 acre-feet for irrigation.

Multiple-Purpose Structure for Flood Prevention
and Municipal Water Supply



Farm Pond Developed for Recreation

These completed watershed projects have 276 miles of channel improvement for flood prevention. The estimated installation costs were $7,712,800 for land treatment and $10,655,900 for structural measures. Average annual floodwater damages were estimated at $797,800 and average annual flood prevention benefits were $848,000 (see tables XXVI-A, -B, -C, and -D).

The 139 projects being installed include upstream watershed projects planned under flood prevention programs PL-534 and PL-566. They include land treatment measures and 1,156 structures, of which 102 are multiple-purpose. Flood prevention storage of 1,115,610 acre-feet and sediment storage of 178,550 acre-feet will be contained in these structures.

The 102 multiple-purpose structures include 31,874 acre-feet for municipal and industrial water supplies; 52,999 acre-feet for recreational uses with 7,222 surface acres; 29,424 acre-feet for fish and wildlife with 3,337 surface acres; and 743 acre-feet for irrigation.

In addition, there are 2,644 miles of channel improvement planned. The estimated installation costs are $74,283,100 for land treatment and $204,754,900 for structural measures. These projects will give varying degrees of protection to 684,005 acres of flood plain lands. The estimated total average annual damages accruing in these 139 watershed projects are $12,609,300. Average annual flood prevention benefits are $15,672,071 (see tables XXVII-A, -B, -C, and -D).

e. Cooperative State and Private Forestry Programs

The Forest Service cooperates with States in providing protection and management assistance in development and wise use of about 68 million acres of state and private forest lands. Cooperative forestry programs conducted by the Forest Service and state forestry agencies are:

1. Watershed protection and flood prevention: The Forest Service, in cooperation with Soil Conservation Service and State foresters, is responsible for assisting local organizations to plan and install forestry measures on private lands to improve forest hydrologic conditions and to achieve soil and water conservation on forest lands aimed at reducing flood, erosion, and sediment damages. Technical forest management assistance is provided without cost to private landowners by the state forester under a cooperative agree-

ment with the Forest Service. This program provides a means of solving watershed protection and flood prevention problems which are not being adequately met by other going programs.

2. Cooperative Forest Management Act of 1950: State foresters, in cooperation with the Forest Service, provide professional assistance and advice to private forest landowners and processors of primary forest products. The States provide foresters to assist private forest landowners in multiple-use forest management and to assist sawmill operators and other processors of forest products in woods and mill safety, efficient methods of cutting, skidding and hauling, improved processing and manufacturing techniques, and marketing information. States are reimbursed from Federal funds on a cost-sharing basis.

3. Timber Development Organizations: Section 204 of the Appalachian Regional Development Act of 1965 provides for technical assistance in the organization and operation under State law of private nonprofit corporations to carry out programs to improve timber productivity and quality and increased returns to owners.

4. Cooperative forest fire control: State foresters provide forest fire protection to state and private forest lands. States administer the programs and are reimbursed from Federal funds on a cost-sharing basis. The Forest Service assists the States in training personnel, preparation of fire plans, development and procurement of better fire equipment and tools, and application of forest fire research. The Forest Service also administers the nationwide forest fire prevention program.

5. Cooperative production and distribution of forest tree planting stock: State Forestry agencies, in cooperation with Forest Service, produce, purchase, and distribute planting stock and forest tree seed at cost, or below cost, for reforesting idle, denuded, or understocked forest lands. The States are reimbursed with Federal funds on a cost-sharing basis. Forest Service provides a tree nursery specialist and geneticist to assist States in conducting the programs.

6. Assistance to States for tree planting and reforestation: Technical and financial assistance is available to the States in undertaking needed direct seeding and tree planting and nursery improvements. The Forest Service provides professional guidance and assistance in forest tree seed improvement through establishment, care, and operation of improved tree seed orchards and production areas.

7. Forest pest control: To assist the States in providing protection against forest insect and disease outbreaks on nonfederal

lands, the Forest Service provides, under cooperative agreement, technical and financial assistance as provided for in the Forest Pest Act of 1947. Funds are provided on a matching basis for use in the development, maintenance, and improvement of a program of insect and disease detection and evaluation. Financing of suppression activities is determined on a case-by-case basis, and Federal financial participation is usually limited to 25 per cent of the total cost of suppression.

8. Blister rust control: Under provisions of the White Pine Protection Act, technical and financial assistance is available to states entering into cooperative agreements with the Forest Service to protect white pine stands from the white pine blister rust disease. This is a continuing program, and once initial control is attained periodic surveys are made to maintain control.

f. National Forest development and multiple-use programs

There are 15 National Forests and one Land Utilization Project either wholly or partly within the Region. Gross area within National Forest boundaries is 14 million acres of which 5.8 million acres are Federally owned.

National Forest land was acquired under the basic authorities of the Weeks Law of 1911, as amended by the Act of 1924. The Acts authorize purchase of land in the waterhseds of navigable streams in order to promote regulation of stream flow and production of timber and direct that the lands so purchased shall be permanently held and administered as National Forests.

Major legislation in recent years strengthens the protection, management, and use of National Forest watersheds. The Land and Water Conservation Fund Act of 1965 provides funds for State and Federal acquisition and development of needed land and water areas for outdoor recreation purposes. Lands acquired by the National Forests under Land and Water Conservation and Weeks Law funds are presently administered under the Multiple-Use Sustained Yield Act of 1960. This Act establishes the policy that the National Forests shall be administered for the management of all the various renewable surface resources -- water, timber, recreation, range, and fish and wildlife purposes.

The value of these properties and public benefits derived from them are steadily increasing. National Forests constitute the largest remaining areas available for public hunting, fishing, and other forms of recreation, and provide goods and services to the people and nation. The rapidly increasing use of these lands for these purposes illustrates their growing importance.

National Forest programs of watershed, outdoor recreation, timber and wildlife management, fire control, and engineering under the Multiple-Use Sustained Yield Act are now making significant contributions toward meeting many of the needs. They can make a greater contribution through implementation of an accelerated program.

g. State development programs

Many states have developed and operate large facilities in the form of state parks, lodges, recreational areas, hunting and fishing areas, and numerous recreational developments within upstream watershed projects. There is both a need and many opportunities for continued development of this kind in the Appalachian Region.

h. Programs of specially organized districts, cities, and towns

Through the years, many states have enacted laws to organize special-purpose districts. These districts allow local people to plan, construct, operate, and maintain specific developments or projects concerning soil and water. All states have passed legislation for special-purpose districts. Their duties, powers, and names vary from state to state, but all have a definite purpose to perform. These special-purpose districts may be conservancy districts, drainage districts, water management districts, etc.

As of June 30, 1967, a total of 955 applications had been made by local Public Service or Water Districts to the Farmers Home Administration for grants and loans. These applications were from rural areas, cities and towns (5,500 population or less), and counties. They were for the improvement, expansion, and installation of public water and sewer facilities. There were 644 applications for water, 194 for sewer, and 111 for both water and sewer. These developments totaled $383.7 million. Of tht total applications, 191 have been approved for construction.

7. RESOURCE POTENTIAL AND DEVELOPMENT FOR ECONOMIC GROWTH

In accordance with Section 206 (a) and (b) of the Appalachian Regional Development Act of 1965, USDA proposals are keyed to development of water and related resources for economic growth. Below are pertinent parts of the Act.

> Sec. 206. (a) . . . to prepare a comprehensive plan for the development and efficient utilization of the water and related resources of the Appalachian Region, giving special attention to the need for an increase in the production of economic goods and services within the region as a means of expanding economic opportunities and thus enhancing the welfare of its people . . . .
>
> (b) This plan may recommend measures for the control of floods, the regulation of the rivers to enhance their value as sources of water supply for industrial and municipal development, . . . the prevention of water pollution by drainage from mines, the development and enhancement of the recreational potentials of the region, . . . the conservation and efficient utilization of the land resource, and such other measures as may be found necessary to achieve the objectives of this section.

a. Land use, treatment, and management

The water resources of the Appalachian Region are affected by the use, treatment, and management of all lands. Land is the base for the conservation, utilization, and development of these water resources. Accelerated application of present and new agricultural technologies in the conservation and development of the Region's land and water resources is needed to provide higher crop yields and reduced farm production costs to offset the projected decline in harvested cropland acreage and the needed land use adjustment.

There are 125,111,400 acres of land in the Region. Table I shows the present and expected acres for the following land use: cropland, pasture, forest and woodland, and other land. This information is presented by the 10 Water Sub-Regions.

Forty-eight per cent of all the land is in capability classes I through IV. Fifty-one per cent of the land is in classes VI and VII. The remainder is in classes V and VIII. There is good potential for development and growth through proper land use, treatment, and management. About 38 per cent of the forest and woodland has a high potential to improve hydrologically, 35 per cent medium, and the remainder low improvement potential. 1/

Planning and implementation of land use changes and acceleration of land treatment measures will be accomplished through local soil and water conservation districts and present regular programs of the USDA's Agricultural Stabilization and Conservation Service, Farmers Home Administration, Forest Service, and Soil Conservation Service. These potentials for development include the present and accelerated treatment needed to meet a goal for a 10-year period.

(1) Cropland: Approximately 12, 131, 700 acres of cropland in the Region need conservation treatment and are feasible to treat. This represents about 62 per cent of the total cropland. Cropland treatment needs to be accelerated on 317, 500 acres per year in addition to the current annual rate of 347, 000 acres. In order to maintain soil productivity, an additional 1, 005, 300 acres now being used for cropland will be converted to less intensive use such as grassland, pasture, woodland, or other uses.

Some of the conservation treatment measures which need to be applied during the period of acceleration are conservation cropping systems, contour strip cropping, terracing, diversion ditches, grassed waterways, field drainage systems, cover crops, and minimum tillage operations. The objectives of these measures are to reduce erosion and the rate of runoff, increase crop yields, reduce production costs, and contribute generally to the economic development of the rural segment of the Region.

(2) Grassland: The Appalachian Region has approximately 16, 035, 300 acres in land used primarily as pasture and/or hayland. Of this, 70 per cent or 11, 159, 400 acres is in need of conservation treatment measures and is feasible to treat. Conservation treatment of grassland (pasture) needs to be accelerated on 317, 800 acres per year in addition to the current annual rate of 467, 000

1/ Hydrologic condition improvement potential is based on aspect, soil class (clay, loam, or sand), soil depth, topography, position on slope, and per cent of slope.

acres. The needs can be divided into 194,900 acres per year for pasture improvement and 122,900 acres per year for pasture planting.

The primary conservation treatment measures will include re-establishment of vegetation, improvement of vegetative cover, protection from overgrazing and encroachment of undesirable plants, and the acceleration keyed to improved water management to provide for better balance of pasture utilization. The grassland program will also reduce erosion, retard runoff, increase infiltration, increase livestock production which is well suited to the land resources, and generally contribute to a balanced economic growth in rural areas.

(3) Forest and woodland

(a) Cooperative State and Private Forestry Program: The Cooperative State and Private Forestry Program for the Appalachian Region includes those measures that can be reasonably installed by landowners over a 10-year period. The programs were developed from data collected by State forestry agencies, U. S. Forest Service, and the USDA CNI and watershed data. Recommended land treatment program for privately owned forest land is as follows:

Measures	Unit	Current Program	Acc'd. Program	Total Program
Tree planting	Acre	806,800	1,377,900	2,184,700
Erosion control	Acre	164,400	717,000	881,400
Harvest cuttings	Acre	1,573,900	1,363,900	2,937,800
Hydrologic stand improvement	Acre	292,000	1,783,500	2,075,500
Woodland grazing control	Acre	242,600	1,422,700	1,665,300
Management plans	No.	43,720	23,150	66,870

Technical forest management assistance is provided without cost to private landowners by the State Foresters under cooperative agreement with the U. S. Forest Service. Agricultural Conservation Program provides cost-sharing with landowners and operators for installation of land treatment measures.

A detailed study of all forest fire problem areas in the Region was not made. Fire occurrence, risk, and hazard problems on state lands are equally severe, and on privately owned lands more severe

Clear Cutting for Even Age Timber Management
Maryland Department of Forests and Parks

Tree Planting for Watershed Protection and
Timber Production

than on the forested area in National Forest ownership. Therefore, it is probable that a detailed survey would have shown a greater need for State and privately owned forest land than for the National Forests.

However, the West Virginia Department of Natural Resources has recommended an accelerated forest fire control program for a critical 12-county area in southwestern West Virginia. The 12-county area has about 3.6 million acres of forest land, or about 34 per cent of the state total, under fire protection. The average number of fires in the 12-county area during 1961-65 was 1,214 or 67 per cent of the state total. The average acreage burned in the 12-county area during the same period was 101,762 acres, or 86 per cent of the state total. The goal is to reduce the average annual burn of 2.8 per cent of forest land to 0.3 per cent or less.

To reduce the average annual burn to 0.3 per cent or less, present fire control program for this critical 12-county area in West Virginia needs the following acceleration:

Measure	Amount
Aircraft Contracts	
Air tankers	2
Air patrol planes	2
Equipment	
Tanker trucks 1/	2
Unimogs	11
Slip-on tanks	18
Transportation	
Station wagons	4
One-half ton trucks	10
Personnel carriers	12
Communications	
Portable radios	24
Mobile radios	4
Relay stations	2
Personnel	14
Training	
Fire wardens and crews	24

1/ Tanker trucks to be acquired from Federal excess property.

(b) State Forest lands: New York, West Virginia, and Maryland have indicated a need for Federal assistance in accelerating the installation of land treatment measures on State Forest lands for a 10-year period. The proposed accelerated land treatment measures for these lands are:

Measure	Unit	Amount
Management plans	No.	241
Tree planting	Acre	4, 500
Erosion control	Acre	1, 600
Harvest cutting	Acre	23, 800
Hydrologic stand improvement	Acre	34,200
Woodland grazing control	Acre	1, 800

Federal assistance could generally facilitate accomplishment of these objectives. (See table XXI-C for further detail.)

(c) National Forest development and multiple-use program: The Forest Service of the U. S. Department of Agriculture is dedicated to the principle of multiple-use management of the National Forests' resources for sustained yields of wood, water, forage, wildlife, and recreation. In the Appalachian Region, a Forest Service objective is to participate with other groups to strengthen the social and economic structure of the area.

To alleviate the problems and contribute toward meeting the needs, the following accelerated 10-year land treatment program for the National Forests within the Region, in addition to regular programs, is:

Measure	Unit	Amount
Timber		
Tree planting	Acre	576, 300
Timber stand improvement	Acre	926, 900
Water yield improvement by vegetative management	Acre	80, 000
Soil and water	Acre	58, 000

Measure	Unit	Amount
Soil survey	Acre	5,789,000
Watershed analysis	Acre	5,400,000
Range management	Acre	2,400
Fire protection	Acre	36,500
Fish and wildlife	Acre	3,031,000

Land treatment program for National Forests is shown in more detail in table XXI-A.

(4) Roadbank stabilization: There are 272,900 miles of primary and secondary roads in the Region. The average roadbank totals approximately three acres of land per mile needing some type of conservation treatment. It is estimated that 112,900 acres now need treatment or 11,300 acres annually. Conservation treatment measures include revegetation of bare areas and maintenance of vegetative cover.

Erosive Condition Before Application of Protective Measures

Stabilized Condition after Application of Protective Measures

(5) Reclamation of surface-mined areas: There are an estimated 943,100 acres of disturbed land to date in the Appalachian Region. An estimated 1,385,600 acres will be disturbed by 1980. To date, about 309,000 acres have been reclaimed with a total of 811,800 acres to be reclaimed by 1980. A total of 334,500 acres are to be reclaimed as a result of the acceleration of conservation treatment measures.

(6) Recreation and wildlife: Conservation treatment measures on recreational and wildlife land for the present and accelerated treatment are as follows:

Practice	Unit	Current	Annually Accelerated	Total
Farm ponds	No.	711	471	1, 182
Fish pond management	No.	3, 753	2, 090	5, 843
Recreational access roads	Ft.	340, 500	452, 300	792, 800
Wildlife habitat development	Ac.	14, 840	12, 880	27, 720
Wildlife habitat preservation	Ac.	83, 710	91, 490	175, 200

b. Structural measures

(1) Upstream watersheds: The 1967 CNI for watersheds indicates that there is an estimated 798 feasible upstream watersheds in the Appalachian Region. These potential watersheds comprise 78, 600 square miles or about 40 per cent of the Region. The Inventory shows that a total of about 5. 5 million acres are subject to floodwater and sediment damage, 5. 2 million acres of agricultural land, and 0. 3 million acres of urban areas. Approximately 83 per cent or 4. 6 million acres needs project action for protection and development. The Inventory also shows water resource problems in upstream watersheds of the Region which need project action for:

1. 916, 000 acres of the 3.6 million acres with a drainage problem.

2. 147, 400 acres of the 271, 600 acres needing improvement or development of water supply or distribution systems for irrigation.

3. over 37 per cent of the upstream watersheds having rural water supply problems.

4. almost 60 per cent of the upstream watersheds needing water developments for fish and wildlife.

5. about 57 per cent of the upstream watersheds which need development of water-based facilities for recreation.

6. almost 24 per cent of the upstream watersheds which need municipal and industrial water supply developments.

7. about 49 per cent of the upstream watersheds which need development of water supplies for water quality management.

Of the 798 feasible upstream watersheds, 198 feasible watersheds have been studied and potential project measures planned to assist in promoting economic growth and development. A benefit-to-cost ratio of 0.8:1 or above was used to determine feasibility with the assumption that with further detailed studies the benefit-to-cost ratio would be 1.0:1 or better. These watersheds were investigated under three different programs:

1. Thirty-six under the PL-566 Program.

2. Sixty-eight under various completed or current river basin studies: 27 in the Tombigbee River Basin, 20 in the Kanawha, 12 in the Potomac, and 9 in the James.

3. Ninety-four upstream watersheds investigated as a part of the Appalachian Water Resource Survey.

The 198 feasible upstream watersheds comprise 25,610 square miles. Identified needs include an estimated 1,836,800 acre-feet of storage for flood prevention, 194,300 acre-feet for municipal and industrial water supply, 3,800 acre-feet for supplemental irrigation, 365,600 acre-feet providing 27,200 surface acres for water-oriented recreation, 64,800 acre-feet for water quality management, and 1,285,300 acre-feet for other or future needs.

See plate 4 for location and tables XXIX, XXX-B, -C, and -E, XL-A, -B, -C, and -D, and XLI-A, -B, -C, and -D for further details regarding the 198 feasible upstream watersheds.

(2) State Forest lands: New York and West Virginia have indicated a need for accelerating the planning, construction, and maintenance of 350 miles of roads and trails on their state forest lands (New York 130 miles, West Virginia 220 miles). New York State plans to acquire abandoned farmland and forest land at a rate of 7,500 acres per year for the next 10 years in the Appalachian Region. With federal assistance, acquisition of an additional 8,000 acres is anticipated during the next 10 years.

(3) National Forests: An accelerated 10-year structural program is needed for National Forests in the Region. In addition to the regular program, the following acceleration is needed:

Measure	Unit	Amount
Fire protection		
Firebreaks	Mi.	225
Fire weather stations	No.	4
Lookout towers	No.	4
Heliports, helispots, & tanker bases	No.	706
Fish and wildlife		
Water developments	Ac.	1,900
Stream & lake habitat development	Ac.	21,800

The planned development for recreation, transportation, and land adjustments on National Forests for the next 10 years is as follows:

Measure	Unit	Amount
Recreation facilities	Acre	15,730
Recreational impoundments	Acre	4,050
Special recreation projects	No.	53
Roads and trail construction (includes bridges)	Mile	6,600
Observation sites	No.	86
Roadside developments	Acre	3,600
Land acquisition	Acre	2,654,400

Most of the above planned developments are located in the Appalachian Highlands Recreation Study Area. These measures are designed to provide additional protection of National Forest lands from fire and pest damages, increase development and utilization of forest and water resources, and provide a healtheir environment for development of the human resource. See table XXI-B and Appendix F -- Recreation and Aesthetics for details.

c. Resource conservation and development projects (RC&D)

The RC&D projects which could be developed within the next 10 to 15 years are those that contribute the most to conservation,

development, and utilization of the natural resources of the area. These projects would increase employment and income, prevent flooding, improve water supplies, afford adequate training, provide adequate sewage and sanitation facilities, improve health and environment, and provide outdoor recreational facilities.

On September 1, 1967, there were six RC&D projects in the planning and application pending stages. Four were being planned and applications for the other two were waiting planning approval. These six projects are:

Project Name	State	No. of Counties	Total Development Area (Sq. Mi.)	Stage
Tombigbee Basin	Ala.	7	5,750	Pending
Northeast	Miss.	19	9,375	Planning
South Western	N. Y.	3	3,463	Planning
Buckeye Hills	Ohio	5	2,443	Planning
Eastern Appalachia	Pa.	4	1,839	Pending
Endless Mountains	Pa.	5	4,007	Planning

Authorization for planning is needed for the Tombigbee Basin Project in Alabama and Eastern Appalachian Project in Pennsylvania. Planning should be accelerated and approval for installation is needed for the remaining projects to assist in economic growth and development.

d. Processing and Marketing of Forest Products

One means of encouraging regional development and economic growth is to improve the processing and marketing opportunities of private landowners. This is discussed briefly under the Timber Development Organizations (TDO's) of the Appalachian Regional Development Act of 1965 (see pages A-102, A-114, A-144, and A-150). Also mentioned is the potential for reducing processing and marketing costs through organization of market specialists. Federal-State assistance for such efforts has been authorized by law, however specific programs remain to be established. It is imperative that such programs be developed and implemented as soon as possible to take advantage of the resource potential and to increase rural income.

e. Research

A strengthened research program is essential to a realization of the resource potential. All phases of forestry research, including marketing and utilization, economics, timber management, engineering, wildlife, and recreation, will be able to make a significant contribution. A strong program in watershed management research, consisting of water supply and flood problems, is especially needed. A much-increased effort must be made to develop improved stripmine reclamation methods so that the environment can be protected while, at the same time, the economic benefits of the coal resource can be realized.

8. IMPACT OF RESOURCE DEVELOPMENT POTENTIAL ON ECONOMIC GROWTH

The total economic impact of the land treatment program was computed for the entire Appalachian Region. The land treatment program is based on the acceleration of land treatment measures over a 10-year period.

The economic expansion effects of water resource developments were computed only for the 94 feasible upstream watersheds studied under the Appalachian Water Resource Survey. However, information and data are also included for 36 watersheds studied under PL-566 program and 68 watersheds studied under various River Basin Surveys, for which preliminary investigation reports had been prepared.

Implementation of most USDA proposals can be quickly started with resulting beneficial impact on the economy of the Region. The generated employment from the proposals will afford immediate employment particularly in rural and small urban areas of chronic unemployment or underemployment.

a. Physical and biological effects

The planning and application of land treatment measures will assist in the economic growth and development of the Appalachian Region. The planned program will accelerate measures on 3,174,500 acres of cropland. Cropland rotations vary from continuous corn to one-year corn and four years of meadow. Present yields and gross returns, before application of conservation treatment and higher level of management, are estimated as follows:

		Low		High		Average	
	Units	Yield	Gross	Yield	Gross	Yield	Gross
Corn	Bu.	38	$ 44.38	55	$ 69.30	49	$ 58.60
Oats	Bu.	40	30.80	60	43.20	50	37.12
Wheat	Bu.	21	27.17	27	36.55	23	29.95
Soybeans	Bu.	22	53.46	23	57.56	22	55.08
Cotton	Lbs.	350	105.00	500	145.00	446	127.93
Hay	Tons	1.0	28.91	2.2	63.40	1.8	47.64

With the application of conservation measures and higher level of management, the yields and gross returns are estimated to be as follows:

		Low		High		Average	
	Units	Yield	Gross	Yield	Gross	Yield	Gross
Corn	Bu.	72	$ 87.58	95	$117.84	84	$ 90.92
Oats	Bu.	69	52.28	73	53.96	71	53.05
Wheat	Bu.	33	41.98	40	47.78	35	44.28
Soybeans	Bu.	33	80.00	35	85.05	34	82.41
Cotton	Lbs.	750	22.97	800	232.00	775	226.62
Hay	Tons	2.5	44.00	4.5	113.85	3.2	85.81

The above yields are averages for the 10 Water Sub-Regions.

Application of conservation measures on grassland and pasture includes the construction and development of springs and ponds for livestock water for better distribution of grazing. Treatment measures consist of improvement or renovation of existing vegetation and new seedings or plantings. Present gain in pounds of livestock per acre and gross returns, before application of conservation treatment and higher level of management, is as follows:

		Low		High		Average	
	Units	Gain	Gross	Gain	Gross	Gain	Gross
Unimproved	Lbs.	26	$5.98	131	$33.95	79	$17.80

With application of conservation measures for new establishment, improvement and renovation, and higher level of management, the gain in pounds of livestock per acre and gross returns are estimated to be as follows:

		Low		High		Average	
	Units	Gain	Gross	Gain	Gross	Gain	Gross
Established	Lbs.	262	$48.72	473	$113.40	310	$68.71
Renovation	Lbs.	158	29.58	289	74.90	216	49.44

Conservation measures for critical area treatment are needed for roadbank stabilization and reclamation of surface-mined areas. Measures needed include grading, shaping, and seeding of grasses or legumes for vegetative cover. The present rate of soil loss per mile of roadbank for untreated area is 125 tons. With the planned treatment, this loss will be reduced by 80 per cent or more. The present rate of soil loss from surface-mined areas is estimated at

55 tons per acre per year. With the planned treatment, this loss will be reduced by 75 per cent or more.

Treatment of recreation and wildlife lands under the planned program includes measures such as development of recreation access roads, farm ponds for fish and wildlife, fish pond management, wildlife habitat development and preservation, and picnic and camping areas. The program will provide the following accelerated measures:

Farm ponds	4, 710 no.
Fish ponds managed	20, 900 no.
Recreation access roads	860 miles
Wildlife habitat development	128, 780 acres
Wildlife habitat preservation	914, 870 acres
Picnic areas	33, 890 acres
Camping areas	13, 460 acres

Ponds managed for fishing total an estimated 6, 270 acres of surface water. Annual recreation-days provided by all above measures are estimated to be 2, 265, 600.

The accelerated land treatment program will require the development of 104, 680 basic conservation plans. This will require an additional 251 man-years of technical assistance per year. Also needed will be a complete soil survey for 45, 071, 000 acres, requiring 209 man-years of technical assistance per year.

One of the most significant of the physical benefits to be derived from the proposed forest land treatment program will be reduced storm runoff by improving the infiltration capacity of the soil. This will cause a reduction in soil movement, improve water quality, and help reduce flooding damages. The tabulation below indicates reduction in surface runoff and in gross erosion by Water Sub-Regions:

Water Sub-Region	Runoff Reduction 1/ Inches	Per cent	Erosion Reduction 2/ Tons Per Sq. Miles Per Year	Per cent
A	0.35	7	45	21
B	0.28	6	45	25
C	0.30	5	270	21
D	0.50	7	275	41
E	0.42	5	140	33
F	0.06	2	25	10
G	0.10	2	40	6
H	0.27	5	245	25
I	0.28	5	220	29
J	0.43	7	250	35
Average	0.28	4	125	24

1/ Based on a 100-year frequency storm of four-day duration. Reference is Technical Paper No. 49 - Weather Bureau, and Technical Paper No. 16 - SCS.

2/ Computed using Musgrave's Soil Loss Prediction Formula.

Many other physical benefits would also accrue as a result of the proposed forest land treatment program. Included would be an improved setting for recreation, better fish and wildlife habitat, enhanced natural beauty, and more and better quality timber.

An estimated 30.1 million visitor-days of high-quality recreation would be provided by the proposed developments on National Forest lands. Other benefits will accrue from the acquisition and management of the additional 2.6 million acres of forest land due to enhanced scenic values, preservation of natural beauty, reduced erosion and sediment production, and better regulation of runoff and access.

There are 198 feasible upstream watersheds, comprising 25,610 square miles, considered for the planned program. Identified needs studied include an estimated 1,836,800 acre-feet of storage for flood prevention; 194,300 acre-feet for municipal and industrial water supply; 3,800 acre-feet for supplemental irrigation; 64,800 acre-feet for water quality management; 4,415 acre-feet for fish and wildlife; 365,600 acre-feet providing 27,200 surface acres for water-oriented recreation; and 1,285,300 acre-feet of storage for other needs and future uses. The feasible watershed developments would protect

from the most frequent flood (3-5 years) about 49,413 acres of flood plain land. Where extensive urban damages occur, a 50-100 year level of flood protection is provided. The planned storage for water supply will serve an estimated population of 532,850. The recreation developments will provide for 12,313,900 annual recreation-days.

b. Economic effects

The planned program of potential water and related resource developments will provide flood prevention benefits which include damage reduction to crops and pasture, erosion and sediment, other agricultural improvements, equipment, and loss of livestock, urban areas, roads and railroads, and indirect. In addition, there will be benefits from more intensive use or changed land use of agricultural land.

Urban damage reduction will have a large effect on the local economy and future economic growth in the Appalachian Region. Money spent on repair of flood damages can then be spent for other goods and services, thus aiding economic growth in the Region. Other benefits from reduced urban damages arise from increased factory payrolls, from fewer shutdowns, and, because of less sediment, from reduced treatment and maintenance costs for public water supply. These all result in additional income or reduced expenses to the local people.

Redevelopment benefits from the potential developments stem from the salaries and wages paid to previously unemployed and underemployed people used in construction and operation and maintenance of the developments.

The developments will also provide benefits for recreation, fish and wildlife, and water supply. Recreational developments will provide regional expansion benefits from increased business activity created by money spent within the area by people from outside the area.

National and regional benefits for industrial development stem from the wages of increased employment in manufacturing plus additional employment in the service sector.

The land treatment program for the Appalachian Region will provide benefits from increase in net farm income and increased cost of production. The increase in cost and income is from higher yields, higher level of management, adoption of new technology,

planning and application of land treatment measures, all of which are a part of a total conservation program. It will act as a stimulus to the Region's economy as described in section a. Increased expenditures will filter into the nonagricultural as well as the agricultural sectors of the economy. The total impact of these increased expenditures and net farm income will result in increased purchasing power and demand for goods and services.

Extensive opportunities for productive work are afforded by the National Forests. Projects can provide training of various skills which will assist in increasing employment opportunities while contributing to the management, conservation, and development of forest resources.

(1) Income and employment: The value of timber products' output including sawlogs, veneer logs, miscellaneous industrial products, pulpwood, and fuel wood delivered at the mill or concentration yard in 1962 was $269 million. This material converted into finished products will produce an income of over $2 billion. The value of timber products' output by 2000 is expected to be $545 million, which will produce an estimate income of nearly $4.4 billion when converted to the final product. Comparable figures for the year 2020 are $638 million and $5.1 billion, respectively. Unfortunately, this final conversion today usually takes place outside of Appalachia. Establishment of final conversion plants within Appalachia would increase the income by an estimated eight times the value of products delivered at the mill or concentration yard and would absorb large numbers of workers now unemployed. It would also considerably reduce the "leakage of economic inputs" and contribute to improvement of the overall economic condition of the Region as a result of the "multiplier effect." Employment in timber-based manufacturing industries is projected to increase by more than 10,000 new jobs by the year 2000. This would provide an estimated annual payroll of $500.0 million.

If the more intensive management recommended in the forest development program becomes a reality, the present number of workers in the woods would increase sharply. Most of this additional work would be done by men presently unemployed and with limited skills.

The acceleration of land treatment measures on cropland, grassland, recreation, wildlife, forest and woodland, and critical areas will generate 3,540 man-years employment annually. This estimate represents the number of employees necessary to construct and install measures. Also, in addition, 3040 man-years' employment

will be generated in the service sector from the above employment. This estimate is the result of applying economic expansion to the number of man-years needed for construction and installation. The technical assistance to carry out the accelerated land treatment program will require 1,230 man-years of employment which will generate 1,020 additional man-years' employment in the service sector. The total employment generated during the period of planning and installation of the recommended acceleration of land treatment measures would be an estimated 8,830 man-years annually.

(2) Agricultural and forest production: Drainage of cropland appears to offer the best potential for improving agricultural production and income through development of water and related land resources.

There are presently 2,351,600 acres of cropland that will respond to drainage. The total net benefits of drainage after deduction of all associated production and on-farm drainage costs is estimated to be $27,560,260 annually.

As flood control measures are installed, there will be more beneficial effects to agriculture from flood damage reduction to crops, pasture, and other agricultural properties. This flood protection will also afford farmers in Appalachia the opportunity of growing higher value crops on the fertile flood plain soils. Additional benefits to agriculture will depend largely on the extent of market expansion due to increased economic activity and employment resulting from the planned program of resource development.

Some Appalachian state representatives have recently expressed the desire for additional irrigation storage in planned upstream reservoirs for use in future years. It is generally agreed that irrigation could be a good method of increasing crop yields and stabilizing production in future years. Therefore, where additional beneficial storage is available in multiple-purpose reservoirs, it should be considered for irrigation.

Increases in quality, quantity, and economic value of timber yields resulting from the forest land treatment program will exceed the investment costs. The economic impact of many man-years of new employment and the substantial benefits that would accrue in terms of recreational opportunity, watershed protection, and wildlife habitat improvement underscore a real opportunity to give an immediate and lasting upward thrust to the economy and well-being of people within the Region.

c. Land treatment measures

The acceleration of conservation planning and application of land treatment measures on cropland, grassland, roadbank stabilization, reclamation of surface-mined areas, forest and woodland, recreation and wildlife lands, and soil survey will provide average annual benefits estimated to be $43, 985, 600. The land treatment program will also provide average annual expansion benefits estimated to be $80, 005, 500.

(1) Cropland: Acceleration of conservation treatment measures on cropland includes erosion control measures, such as contour-strip cropping, diversions, grassed waterways, and excess water control practices, such as tile drains, field ditches, and mains and laterals. Total installation cost for these measures is estimated to be $42, 805, 200.

The economic impact includes the increase in gross farm income due to the accelerated program and the expansion effect the increased income would have on the economy of the Region. This data was developed by Water Sub-Regions.

(2) Grassland: Conservation measures on grassland include springs and pond development for livestock water to better utilize the grass. Total installation cost for these measures is estimated to be $25, 455, 500. The economic impact includes the increase in gross farm income due to the accelerated program and the expansion effect the increased income would have on the economy.

(3) Forests and woodland: Accelerated measures on forest and woodland include private, State, and National Forest lands. The measures include tree planting, erosion control, harvest cutting, hydrologic stand improvement, woodland grazing control, access roads, fish and wildlife management, fire protection, and soil and water conservation measures. Total installation cost for these measures is as follows:

Private forest and woodland	$100, 555, 500
State Forest lands	1, 574, 300
National Forests	76, 012, 800

See tablex XX-A and -B and XXI-A for further details.

In addition, the West Virginia Department of Natural Resources has requested acceleration of forest fire control program for a 12-

county critical area in southwestern West Virginia at an estimated installation cost of $1, 266, 000.

(4) Roadbank stabilization: Cost for the accelerated conservation measures includes cost of materials, such as seed, fertilizer, lime, and mulch, and of labor and land grading where necessary. Total installation cost for these measures is estimated to be $39, 156, 500. The economic impact includes benefits from reduced cost of silt removal from road ditches and streams, improved wildlife habitat, and scenic value. Also included is the expansion effect the benefits would have on the economy of the Region.

(5) Reclamation of surface-mined areas: Land treatment measures on surface-mined areas include shaping, grading and filling where necessary, and seeding, lime, and fertilizer for establishment of vegetative cover. Total installation costs for these measures are estimated to be $25, 353, 800. The economic impact includes benefits from reduction in soil loss and decreased cost of sediment removal, improved wildlife habitat, timber production, and scenic value. However, benefits from timber production were not evaluated. The expansion effect the benefits would have on the Region was included.

(6) Recreation and wildlife land: Conservation treatment measures on private land include farm ponds for fish and wildlife, fish pond management, wildlife habitat development, wildlife habitat preservation, recreation access roads, picnic areas, and camping areas. The cost includes development of associated facilities as well as cost of conservation treatment practices. Total estimated installation cost for the measures is $155, 078, 920. The economic impact includes benefits from activities such as fishing, camping, picnicking, hunting, and improved wildlife habitat. The expansion effect from the above benefits on the economy was included.

(7) Conservation planning and soil survey: In order to carry out the accelerated land treatment program, it is necessary to provide technical assistance for conservation planning and soil survey. Conservation planning and soil survey will require an additional 461 man-years of employment annually. Total cost for these measures is estimated to be $46, 060, 000. The acceleration of conservation planning and soil survey will benefit the region by giving valuable technical assistance to owners and operators of agricultural enterprises. These benefits represent the wages and salaries of additional personnel necessary for acceleration. Also, 379 man-years' employment will be generated in the service sector from the above employment. The economic impact includes the

above benefits and expansion effect of the money spent in the service sector.

d. Structural measures

(1) Upstream watersheds: Water resource developments planned by the U. S. Department of Agriculture include 198 feasible upstream watersheds. There are 17 watersheds which would provide sufficient flood protection to flood plain land to permit needed industrial, commercial, or residential development. Development of this land is necessary for economic growth in the watersheds. Total installation cost for the 198 watersheds is estimated to be $492,907,200.

These watershed developments will provide a total estimated flood damage reduction benefit of $9, 624, 800 annually. Land enhancement benefits are estimated to be $1, 884, 300 annually. Of this, $1, 699, 300 would accrue to agricultural land. Changed land use benefits for urban enhancement would amount to $185, 000 annually.

The feasible developments can provide 12, 313, 900 annual recreation-days to help meet the projected demand by 1980. They would also provide 27, 200 acres of water for boating and fishing. The multiple-purpose developments will provide total estimated benefits from recreation and fish and wildlife of $16, 023, 100 annually. Incidental recreation benefits from use of sediment pools of flood prevention structures are estimated to be $416, 400 annually.

The projected water supply and water quality needs by 1980 can partially be met by the water resource developments. These developments can provide total estimated benefits of $1, 326, 700 annually. Also, the storage for irrigation would provide estimated annual benefits of $77, 900.

Redevelopment benefits from the water resource developments reflect salaries and wages of unemployed and underemployed people (unskilled and semi-skilled) used in construction and operation and maintenance. From studies of previously constructed projects, it was found that about 35 per cent of the construction costs was paid to labor. The labor force was then divided into skill levels, in which about 57 per cent was unskilled and semi-skilled. A study of the operation and maintenance cost showed that about 75 per cent was paid to labor. Of this amount, 45 per cent was within the unskilled and semi-skilled groups. The redevelopment benefits were divided into national and regional accounts.

In evaluation of the water resource developments, a multiplier concept was used to measure employment and income expansion for private and public investment within the development. There are 17 of the 198 watersheds which will provide sufficient flood protection for industrial, commercial, or residential site development. These developments could provde 25,533 new jobs over a period of 25 to 50 years as a result of industrial development in these watersheds. The new jobs would create a payroll of $245.7 million annually. This payroll includes both the manufacturing and service sectors of the economy. The income expansion resulting from the increased payroll and induced investment, both public and private, was divided between a national and regional account.

The annual recreation-days will provide regional income expansion benefits from the money spent within the watershed by people from outside the watershed. The benefits were based on a daily expenditure of $1.00 per visitor for people who traveled one way a distance of 26-50 miles and $3.00 per visitor for people who traveled 51 miles or more one way to reach the recreational facilities.

National expansion benefits from agricultural enhancement were based on increased net income from more intensive land use and changed land use of agricultural land. The following tabulations (starting on next page) show the user and expansion benefits for both the national and regional accounts.

(2) State Forest lands: The structural measures on State lands include land acquisition and road construction. The estimated cost for installation is $1,249,300.

(3) National Forests: Water resource development on National Forest lands includes structural measure for fire protection, fish and wildlife management. Total installation cost is estimated to be $3,798,800. The recreation developments include special projects, recreation facilities, and recreation impoundments. Total installation cost is estimated to be $360,314,900. Cost of road and trail construction, roadside developments, observation sites, and bridges is estimated to be $171,621,300. Land adjustment costs are estimated to be $247,275,400.

These measures would provide employment in wildlife habitat improvement, construction of recreation areas, and roads and trails. Direct employment in these programs will create even greater indirect employment opportunities and economic benefits.

USER BENEFITS AND EXPANSION

	Flood Prevention	Land Enhancement Agric.	Land Enhancement Urban	Recreation & Fish & Wildlife	Irrigation * & Drainage	Water Supply & Quality *	Incidental Recreation	Total
PL-566	1, 841, 340	423, 793	33, 140	938, 193	55, 664*	86, 719	61, 169	3, 440, 018
WRS	3, 762, 240	647, 700	130, 200	11, 751, 300	18, 900* 300	750, 300 27, 600*	224, 000	17, 312, 540
Potomac RB	869, 720	--	--	--	--	--	--	869, 720
James RB	427, 195	204, 200	--	98, 380	--	174, 400	19, 990	924, 165
Kanawha RB	776, 340	57, 080	21, 700	3, 225, 200	3, 300* 16, 200	94, 900 192, 800*	111, 263	4, 498, 783
Tombigbee RB	1, 947, 928	366, 528	--	--	--	--	--	2, 314, 456
Total	9, 624, 763	1, 699, 301	185, 040	16, 013, 073	77, 864* 16, 500	1, 106, 319 220, 400*	416, 422	29, 359, 682

	National Account Only	Regional Account Only	Both National & Regional	Total National Benefits	Total Regional Benefits
PL-566:					
User			3, 440, 018	3, 440, 018	3, 440, 018
Redevelopment			395, 459	395, 459	395, 459
Secondary			324, 011	324, 011	324, 011
Subtotal			4, 159, 488	4, 159, 488	4, 159, 488
WRS:					
User			17, 312, 540	17, 312, 540	17, 312, 540
Redevelopment		2, 740, 500	3, 296, 400	3, 296, 400	6, 036, 900
Expansion:					
Development		91, 922, 000	24, 637, 700	24, 637, 700	116, 559, 700
Agricultural Enhancement			643, 300	643, 300	643, 300
Recreation		5, 906, 400	--	--	5, 906, 400
Subtotal		100, 568, 900	45, 889, 940	45, 889, 940	146, 458, 840
Potomac River Basin:					
User			869, 720	869, 720	869, 720
Subtotal			869, 720	869, 720	869, 720
James River Basin:					
User			924, 165	924, 165	924, 165
Redevelopment			195, 535	195, 535	195, 535
Secondary			90, 850	90, 850	90, 850
Subtotal			1, 210, 550	1, 210, 550	1, 210, 550

	National Account Only	Regional Account Only	Both National & Regional	Total National Benefits	Total Regional Benefits
Kanawha River Basin:					
User			4, 498, 783	4, 498, 783	4, 498, 783
Redevelopment			612, 200	612, 200	612, 200
Secondary			75, 200	75, 200	75, 200
Subtotal			5, 186, 183	5, 186, 183	5, 186, 183
Tombigbee River Basin:					
User			2, 314, 456	2, 314, 456	2, 314, 456
Secondary			320, 270	320, 270	320, 270
Subtotal			2, 634, 726	2, 634, 726	2, 634, 726
Total		100, 568, 900	59, 950, 607	59, 950, 607	160, 519, 507

9. PROGRAMS AND COORDINATION FOR FUTURE POTENTIAL DEVELOPMENT

All present natural resource-oriented and supporting programs of the U. S. Department of Agriculture will be needed in the development of water and related resources to meet economic goals of selected potential growth areas of the Region. Principal programs needed are those concerned with:

1. Land use changes.

2. Stabilization of critically eroding and sediment-producing areas.

3. Multiple-use management of National Forest and eventually all publicly owned forests.

4. Establishment and improvement of desirable types of vegetative cover.

5. Greater control and development of water resources in the upstream areas for agriculture, forestry, flood prevention, recreation, fish and wildlife, and small urban and rural communities, and to provide flood-free sites in flood plain areas to encourage private investment in industrial and commercial developments.

Present programs directly involved include: Soil and Water Conservation (PL-46); Upstream Watershed (PL-566); Flood Prevention (PL-534); Resource Conservation and Development (PL 87-703); Cooperative State and Private Forestry; National Forest Administration; Forest and Agricultural Research; and other programs of technical and financial assistance to individual landowners, operators, and rural and small urban groups.

USDA agencies administering these programs are: Agricultural Stabilization and Conservation Service (ASCS), Farmers Home Administration (FHA), Forest Service (FS), and Soil Conservation Service (SCS). The Federal Extension Service (FES), through state universities, provides assistance by informing and educating the public on these programs.

Further coordination among USDA agencies will be required during detailed planning of the various proposals.

If full development of physical and economic potential is to be approached in the Region, all present programs must be greatly accelerated and, in many cases, expanded.

a. Alternative or additional considerations

Any consideration must recognize the fact that our growing population and development will place a greater demand on efficient use of all natural resources. Some considerations are:

1. Instead of surface storage, municipal and industrial water needs in the Region may be partially met through the development of ground-water supplies and improved treatment techniques for repeated re-use.

2. Better techniques and control or, under certain conditions, elimination of coal strip-mining activities would greatly reduce the erosion and sedimentation problem.

3. Greater public ownership of land that is uneconomical for agricultural or timber production due to low inherent fertility and productiveness, but which plays an important role in the improvement and maintenance of watershed values. Ownership should be at the level (town, county, district, state, or Federal) which would be in the greatest public interest.

4. Consolidation of small timber ownerships into Timber Development Organizations, authorized by Section 204 of the Appalachian Act, for management purposes under the guidance of professional consultants.

5. The use of special real estate tax incentives, particularly for timber landowners, in order to secure needed water and other resource measures to help provide the necessary base for economic growth. Also, the development and adoption of uniform and fair tax assessment values for agricultural and forest land based on productive capacity of the site.

6. Relocation and new construction of roads, houses, and other improvements out of the narrow flood plains.

7. A vast resettlement program of moving people out of isolated areas into or closer to rural centers having facilities and potential for economic growth.

b. <u>Projects or measures needed but not presently available</u>

Additional measures needed but not now readily available include those for:

1. Control or prevention of detrimental washings from refuse piles resulting from coal mining, steel, and other manufacturing processes.

2. Control of runoff and sediment from expanding urban areas with particular attention to modifying methods of land clearing and grading and construction.

3. Control of runoff and sediment during the vast new highway construction program.

4. Control of organic and inorganic wastes resulting from agricultural and industrial production.

5. Evaluation and demonstration projects for erosion control and water disposal in urban areas.

6. Land use and zoning regulations.

c. <u>Other agency programs and their impacts</u>

The recommended programs and projects of all other agencies engaged in this study were considered in formulating the recommendations by the U. S. Department of Agriculture. However, the impact of all U. S. Army Corps of Engineers' projects recommended involving National Forests and their plans for development have not been fully evaluated or coordinated. The success and effectiveness of the USDA programs and projects depend, to a considerable degree, on the programs and projects of other agencies. In many cases, the programs and projects supplement each other.

The recommendations and recommended programs and projects of U. S. Army Corps of Engineers, Bureau of Sport Fisheries and Wildlife, and Federal Water Pollution Control Administration of U. S. Department of the Interior, along with those of the Bureau of Public Roads of U. S. Department of Transportation, will be of particular importance in supplementing USDA programs and projects. Maximization of benefits and effectiveness of all recommendations and recommended Federal programs and projects will be possible only by being keyed to the Development Plans of the individual states, including the Comprehensive Statewide Outdoor Recreation Plans. The close coordination maintained in this survey made it possible for each agency to more fully and efficiently concentrate in its particular field of competence. It should result in an effective overall plan for the increased production of goods and services from development of water and related resources to stimulate economic growth of the Region.

d. Projects which should be planned jointly

Close working relations and coordination should be continued in planning USDA Upstream Watershed Projects with State Natural Resource Agencies, Soil Conservation District, U. S. Army Corps of Engineers, Tennessee Valley Authority, and U. S. Department of the Interior's Bureau of Sport Fisheries and Wildlife and Federal Water Pollution Control Administration.

There is presently pending no USDA Upstream Watershed in Water Sub-Region A which requires special joint planning.

Because of interrelated completed, authorized, or potential U. S. Army Corps of Engineers projects and present arrangements with Tennessee Valley Authority, consideration should be given to further joint detailed planning of the following upstream watersheds:

Water Sub-Region	Location Number 1/	Watershed Name	State
B	2	Upper Casselman River	Md.
B	66	Stony Creek	Pa.
B	P-10	North Fork South Branch	W. Va.
B	P-11	South Branch	W. Va.
B	P-12	Mill Creek	W. Va.
B	P-3	North Branch	W. Va.

Water Sub-Region	Location Number 1/	Watershed Name	State
C	10	Back Creek	Va.
C	31	Jackson River 2 2/	Va.
D	60	North Oconee River	Ga.
D	15	Little Beaver Dam	S. C.
D	20	Eighteen Mile Creek	S. C.
E	37	Wehadkee Creek	Ala.
E	55	Suwanee Creek	Ga.
E	56	Tesnatee Creek	Ga.
E	59	Mill Creek Area	Ga.
E	62	Wahoo-Little River	Ga.
E	63	Young Cane Creek	Ga.
F	13	Great Valley	N.Y.
F	15	Little Valley	N.Y.
F	25	Connoquenessing Creek	Pa.
F	54	Blacklick Creek	Pa.
F	56	French Creek (Upper)	Pa.
F	59	Mahoning Creek	Pa.
F	60	Oswago Creek	Pa.
F	61	Potato Creek	Pa.
F	64	Sewickley Creek	Pa.
F	68	Tionesta Creek	Pa.
F	70	Upper Allegheny River	Pa.
F	71	Upper Loyalhanna Creek	Pa.
F	72	West Branch Clarion River	Pa.
F	64	Ten Mile Creek	W. Va.
F	79	Elk Creek	W. Va.
G	7	Grassy Creek	Ky.
G	14	Upper White Oak Creek	Ohio
G	42	Little Stony Creek 2/	Va.
G	48	Peak Creek	Va.
G	74	Mill Creek	Va.
G	21	Beaver Creek	W. Va.
G	22	Grassy Creek	W. Va.
G	25	Cherry River	W. Va.
G	80	French Creek	W. Va.
G	93	Upper Buckhannon River	W. Va.
H	23	Upper Red River	Ky.

Water Sub-Region	Location Number 1/	Watershed Name	State
I	15	Casey Creek	Ky.
I	18	Marrowbone Creek	Ky.
I	21	Calfkiller River	Tenn.
I	23	Putnam-Cane Creek	Tenn.
J	61	Peavine Creek	Ga.
J	7	Cane Creek	N. C.
J	18	Tallulah Creek 2/	N. C.
J	12	Hickory Creek	Tenn.
J	13	Horse Creek	Tenn.
J	16	Sweetwater Creek	Tenn.
J	17	Bent Creek	Tenn.
J	18	Blackwater Creek	Tenn.
J	19	Black Wolfe Creek	Tenn.
J	20	Bull Run Creek	Tenn.
J	24	Charles Creek	Tenn.
J	26	Mountain Creek	Tenn.
J	27	Perkins Creek	Tenn.
J	29	Coahulla Creek	Tenn.

1/ See plate 4 for location.
2/ The Forest Service will make a detailed study and appraisal to supplement the proposed projects before authorization for detailed planning is initiated.

In the future, working relations and coordination should be strengthened with the Bureau of Outdoor Recreation, Federal Water Pollution Control Administration, and Bureau of Mines of U. S. Department of the Interior; Bureau of Public Roads, U. S. Department of Transportation; U. S. Department of Health, Education, and Welfare; and state Departments of Health and Commerce. This is important to insure efficient and full potential development of water and related resources of the Region.

e. New approaches or modification of present programs

The principal need in the Region is acceleration of existing programs of the U. S. Department of Agriculture dealing with the conservation and development of natural resources. This

acceleration of going programs is in line with long-term responsibilities assigned by Congress through various legislative authorizations to the Department during the early 1900's, mid-1930's and 1950's, and first half of the 1960's. The legislation was recognition by Congress of these basic concepts: (1) that the conservation, development, and wise use of natural resources is in the national interest; (2) that all resources -- soil, water, plants, and animals -- cannot be effectively used or managed separately but are completely interdependent; and (3) that the landowner, operator, and the general public have joint economic responsibilities in these areas.

However, some new approaches are needed and include:

1. Technical assistance to local units of government for:

   a. Developing guidelines or regulations for control of erosion and sediment in urban areas.

   b. Services of specialists to individuals, contractors, or others to assist in designing specific measures for the control of erosion and sedimentation in urban areas.

   c. Demonstrations of measures to control erosion and sedimentation on publicly owned construction areas.

   d. Installing sediment detention basins below sediment-producing areas.

2. Construction of sediment detention basins, diversions, and various temporary control measures on highway rights-of-way and on private lands below, during new road construction.

3. Give equal approval priority for planning and installation of feasible projects for all justifiable primary purposes which are needed for economic development. This includes projects having a majority of nonagricultural purposes, such as water supply for municipal and industrial use, improved stream fisheries, or water-based recreation.

4. Provide for Forest Service programs for Appalachia with financing at the maximum level authorized by

law. This financing would provide technical assistance and protection through the States to forest and woodland owners and forest product processors.

5. Organize, train, and equip work crews for hire by landowners, operators, timber owners, and others to install various conservation practices and structures. Soil Conservation Districts, State Forestry organizations, or private contractors will manage and supervise crews. Until a sufficient work load is developed, it may be necessary, in order to provide full-time employment, to make such crews available for use by city, county, state, and Federal agencies on public conservation projects. Timber Development Organizations, authorized by Section 204 of the Appalachian Act, would be an effective vehicle for implementing this proposal.

Modifications in some criteria of present programs will also be needed. Chief among these are:

1. Upstream Watershed Program (PL-566)

    a. Provide temporary Federal financing or underwriting of some of the local costs, such as easements, rights-of-way, and operation and maintenance, with a definite plan for deferred repayment when local sponsors are initially unable to meet their financial responsibilities. Increased funding by States will also help meet this need.

    b. Provide Federal cost-sharing for storage for water quality management in accordance with other National programs.

    c. Provide for full physical development of each structure site to support not only immediate but long-term projected economic growth when maximum development is feasible but local financing is not currently available.

    d. Provide for special Federal funding for all costs allocated to the National Forests involving construction of multiple-purpose structures and the development of associated recreation or fish and wildlife facilities.

2. In the Agricultural Conservation Program, provide up to 100 per cent Federal financing for establishment of those conservation measures which result in little or no immediate economic return to landowners and operators but have important off-site benefits. All measures to be maintained by landowner or user.

3. Provide Federal financing to accelerate development of forest resources on State lands.

4. Amend current Development Programs for National Forests to include the proposed accelerated recreation development program for Appalachia.

10. RECOMMENDATIONS

a. Acceleration of present programs

U. S. Department of Agriculture's recommendations include accelerated land treatment and structural measures with priorities on private lands and State and National Forest lands.

(1) Land treatment measures: This includes the planning and installation of the following measures on private lands:

Measure	Units	Amount
Cropland	Acres	3, 174, 500
Grassland		
Plantings	Acres	1, 228, 700
Renovation	Acres	1, 949, 200
Critical Area Stabilization		
Roadbanks	Acres	112, 900
Surface Mined Areas	Acres	334, 500
Recreation and Wildlife Land		
Farm Ponds	No.	4, 710
Pond Management	No.	20, 900
Recreation Access Roads	Miles	860
Wildlife Habitat Development	Acres	128, 780
Wildlife Habitat Preservation	Acres	914, 870
Conservation Plans	No.	104, 680
Soil Survey	Acres	45, 071, 000
Forest and Woodland		
Management Plans	No.	23, 150
Tree planting	Acres	1, 377, 900
Erosion control	Acres	717, 000
Harvest cutting	Acres	1, 363, 900
Hydrologic stand improvement	Acres	1, 783, 500
Woodland grazing control	Acres	1, 422, 700

The West Virginia Department of Natural Resources has recommended an accelerated forest fire control program for a 12-county critical area in southwestern West Virginia. The present fire control program needs the following acceleration:

Measure	Units	Amount
Aircraft Contracts		
Air tankers	No.	2
Air patrol planes	No.	2
Equipment		
Tanker trucks	No.	2
Unimogs	No.	11
Slip-on tanks	No.	18
Transportation		
Station wagons	No.	4
Half-ton trucks	No.	10
Personnel carriers	No.	12
Communications		
Portable radios	No.	24
Mobile radios	No.	4
Relay stations	No.	2
Personnel	No.	14
Training		
Fire wardens and crews	No.	24

The accelerated land treatment measures on State Forest lands are as follows:

Measure	Units	Amount
Management plans	No.	241
Tree planting	Acres	4,500
Erosion control	Acres	1,600
Harvest cutting	Acres	23,800
Hydrologic stand improvement	Acres	34,200
Woodland grazing control	Acres	1,800

The accelerated land treatment measures on National Forest lands are as follows:

Measure	Units	Amount
Timber		
Tree planting	Acres	576,300
Timber stand improvement	Acres	926,900
Water yield improvement by vegetative management	Acres	80,000
Soil and water		
Gully stabilization	Acres	3,200

Measure	Units	Amount
Sheet erosion control	Acres	12, 300
Streambank stabilization	Acres	3, 300
Stream channel clearing	Acres	8, 100
Rehabilitated abandoned roads and trails	Acres	26, 100
Mined area stabilization	Acres	3, 700
Pollution abatement	Acres	1, 400
Soil survey	Acres	5, 789, 000
Watershed analysis	Acres	5, 400, 000
Range management	Acres	2, 400
Fire protection	Acres	36, 500
Fish and wildlife	Acres	3, 031, 000

Priority for accomplishment of the above land treatment measures is as follows:

1. Stabilization of critically eroding areas throughout the entire Region with special emphasis on areas upstream from all completed, authorized, or planned USDA, Tennessee Valley Authority, Corps of Engineers, and other water resource developments. To be accomplished during the period 1970-1980.

2. Acceleration of land treatment on watersheds of recommended projects for Corps of Engineers (15-20), Tennessee Valley Authority (1), and USDA Upstream Watersheds (198), the most of which are directly vectored towards identified growth centers. The area involved equals about 22 per cent of the Region. To be accomplished by 1990.

3. Acceleration of land treatment on watersheds of completed and authorized water resource developments of the Corps of Engineers, Tennessee Valley Authority, and other public and private interests. Area involved equals about 28 per cent of the Region. To be accomplished by 1990.

4. Acceleration of land treatment on remaining areas of the Appalachian Region. To be accomplished by 1990.

(2) Structural measures: The recommended planned program for structural measures include planning and installation of the following measures:

1. Plan and install 198 feasible upstream watersheds. See table XLV and plate 4 for identification and location.

2. Measures on State Forests include land acquisition of 8,000 acres and construction of 350 miles of access roads.

3. Measures on National Forests for fire protection includes construction of 225 miles of firebreak, 4 fire weather stations, 4 lookout towers, 4 heliports, 700 helispots, and 2 air tanker bases, to be accomplished by 1990.

The fish and wildlife measures include 1,900 acres of waterholes, potholes, small ponds, and impoundments for waterfowl, and 21,800 acres of stream and lake habitat improvement.

The planned development for recreation, transportation, and land adjustments on National Forests include:

Measure	Unit	Amount
Recreation facilities	Acres	15,730
Recreational impoundments	Acres	4,050
Special recreation projects	No.	53
Road and trail construction (includes bridges)	Miles	6,600
Roadside development	Acres	3,600
Observation sites	No.	86
Land acquisition	Acres	2,654,400

Priority for the installation of recommended structural measures is as follows:

1. Plan by 1980 and complete installation by 1990 the 198 recommended PL-566 Upstream Watersheds together with recreational and other developments in the National Forests and State Forests. Also accelerate rate of installation of the 139 presently authorized upstream watershed projects so as to complete installation by 1980. See tabulation starting on page A-164 for complete details regarding individual priority for the recommended watersheds.

2. After 1990, plan and install 250 feasible upstream watershed projects remaining from the original total of 798 watersheds shown by the 1967 Conservation Needs Inventory for Watersheds.

b. New approaches or modification of present programs

It is recommended that necessary action be taken to implement the new approaches and modification of present programs as listed in Section 9e of this report.

c. Implementation and funding of recommended developments

Proposals for minor changes in existing authorities and programs and general estimates of the additional total funds needed for the recommended acceleration of the three programs discussed herein are presented in the following paragraphs. The Appalachian Water Resource Survey's Main Report and the 10 Water Sub-Region Reports plus Appendix A -- Agriculture, Forestry and Conservation and Appendix F -- Recreation and Aesthetics present the detailed descriptions of need to support these funding proposals. The Main Report recommends the funding for the first year's acceleration. Funding of the accelerated program in subsequent years will be by the Appalachian Regional Commission. The Department will maintain close and annual cooperation with the Appalachian Regional Commission. Proposals for changes in existing authority will be made to the Appalachian Regional Commission for possible inclusion in proposed legislation to the 91st Congress.

(1) Implementation: The recommended development will be accomplished through an acceleration of going agency programs using existing authorities with such minor modifications as are indicated below:

Agricultural Stabilization and Conservation Service (ASCS): Accelerated cost-sharing on land treatment measures to be installed on lands of individuals and groups of land occupiers and uses in areas identified with designated growth centers, using existing authorities of the Soil Conservation and Domestic Allotment Act and of PL 89-4, Section 203, modified to permit increasing the 50-acre restriction for those critical areas identified with growth centers.

Farmers Home Administration (FHA): Provide Water Development and Soil Conservation Loans, Watershed Loans, Association Loans, and Loans and Grants for community water and sewer systems for rural areas under existing authorities.

Forest Service (FS): Administer the National Forests and provide technical and cost-sharing assistance to Cooperative State and Private Forestry Programs, Watershed Protection

Programs, Resource Conservation and Development Projects, and the Appalachian Regional Program under existing authorities.

Provide for Forest Service programs for Appalachia with financing at the maximum level authorized by law. This financing would provide technical assistance and protection through the States to forest and woodland owners and forest product processors.

Soil Conservation Service (SCS): Provide technical and cost-sharing assistance to Soil Conservation District Programs, Watershed Protection and Flood Prevention Programs, Resource Conservation and Development Projects, National Cooperation Soil Survey Programs, and the Appalachian Regional Development Programs under existing authorities with the modifications indicated below:

1. Provide technical assistance and cost-sharing to state and county road agencies, local units of government, and contractors for planning and installing soil and water conservation measures on eroding secondary roads, rights-of-way, and during and after new highway and other construction in highly erodable soils.

2. Provide technical and cost-sharing assistance at an accelerated rate for stabilization of abandoned strip-mined areas on privately owned land through soil conservation districts. Cost-sharing not to exceed 100 per cent of the costs when benefits will accrue primarily off site and 50 per cent when primarily on site.

3. Provide Federal cost-sharing of storage for water quality management in accordance with other national programs.

If experience in the implementation of this program indicates that additional authorities are needed, subsequent proposals for new legislation will be developed.

(2) Funding: The total projected estimated cost of all USDA recommended developments is \$2.3 billion. Of this total, \$2,071.5 million is Federal and \$206.3 million others. First-year Federal funding is estimated to be \$50.9 million or about 37 per cent increase over the average annual funding of the past three fiscal years. For the following four to six years, the recommended proposals would require average annual Federal funding of about \$79.4 million. This

breaks down into $17.6 million for land treatment, $22.5 million for upstream watershed projects, and $39.3 million for structural measures on National Forests. Although fundings and estimates are made annually, a complete re-evaluation of funding requirements will be made at the end of the fifth year.

Details of costs and funding by agencies and priority for the recommended developments with first-year's estimates are given in the following tabulations.

ACCELERATED LAND TREATMENT

Priority	ESTIMATED COSTS (MILLION) Plan'g. 1/ FS & SCS	Installation FS & SCS	Installation ASCS	Installation Others	Installation Total	First Year Funding FS & SCS	First Year Funding ASCS	First Year Funding Others
1 Stabilization of critically eroding areas throughout the entire Region with special emphasis on areas upstream from all completed, authorized, or planned USDA, Corps of Engineers, Tennessee Valley Authority, and other water resource developments. Tied directly to growth areas. To be accomplished in 10 years.								
Private Lands 2/	23.4	1.3	47.8	12.0	84.5	2.6	4.8	1.1
National Forests	2.5	11.8	--	--	14.3	1.4	--	--
Subtotal	25.9	13.1	47.8	12.0	98.8	4.0	4.8	1.1
2 Conservation land treatment measures for watersheds of recommended Corps of Engineers (15-20), Tennessee Valley Authority (1), and USDA Upstream Watershed (198) projects; area involved equals about 22 per cent of the Region. Tied directly to growth areas. To be accomplished in 20 years.								
Private Lands 3/	18.5	0.3	47.0	11.8	77.6	0.9	2.4	0.6
National Forests	2.8	10.8	--	--	13.6	0.7	--	--
Subtotal	21.3	11.1	47.0	11.8	91.2	1.6	2.4	0.6

ACCELERATED LAND TREATMENT (continued)

Priority 1/	Plan'g: FS & SCS	Installation: FS & SCS	Installation: ASCS	Installation: Others	Total	First Year Funding: FS & SCS	First Year Funding: ASCS	First Year Funding: Others
3 Conservation land treatment measures for watersheds or completed and authorized water resource reservoir developments of the Corps of Engineers, Tennessee Valley Authority, and others; area involved equals about 28 per cent of the Region. Tied in part directly to growth areas. To be accomplished in 20 years.								
Private Lands 3/	23.5	0.4	59.9	15.0	98.8	1.2	2.9	0.8
National Forests	3.5	13.8	--	--	17.3	0.9	--	--
Subtotal	27.0	14.2	59.9	15.0	116.1	2.1	2.9	0.8
4 Conservation land treatment measures for remaining areas of the Appalachian Region; area involved equals about 50 per cent of the Region. Tied in part directly to growth areas. To be accomplished in 20 years.								
Private Lands 3/	42.0	0.8	106.9	26.7	176.4	--	--	--
National Forests	6.3	24.6	--	--	30.9	--	--	--
Subtotal	48.3	25.4	106.9	26.7	207.3	--	--	--
All Private Lands 2/	107.4	2.8	261.6	65.5	437.3	4.7	10.1	2.5
National Forests	15.1	61.0	--	--	76.1	3.0	--	--
Total	122.5	63.8	261.6	65.5	513.4	7.7	10.1	2.5

STRUCTURAL MEASURES

Priority 1/	Plan'g. FS & SCS	Installation FS & SCS	Installation ASCS	Installation Others	Total	First Year Funding FS & SCS	First Year Funding ASCS	First Year Funding Others
1 (1) Upstream Watersheds - 198: 94 Water Resource Survey; 36 PL 566; 20 Kanawha River Basin; 12 Potomac River Basin; 27 Tombigbee River Basin; 9 James River Basin. To be accomplished in 20 years. Acceleration of the rate of installation of the 139 presently authorized PL-566 Upstream Watersheds	16.0	418.5	--	74.4	508.9	22.5	--	3.7
(2) National Forests Programs:								
Fire Control	0.2	0.5	--	--	0.7	0.2	--	--
Fish and wildlife improvements	0.6	2.5	--	--	3.1	0.8	--	--
Recreation and aesthetics	54.1	306.2	--	--	360.3	9.6	--	--
Transportation facilities	25.7	145.9	--	--	171.6	--	--	--
Land acquisition	37.1	210.2	--	--	247.3	--	--	--
(3) State Forests	--	1.2	--	--	1.2	--	--	--
Subtotal	133.7	1,085.0	--	74.4	1,293.1	33.1	--	3.7
2 After 1990, plan and install the remaining 250 feasible Upstream Watersheds as shown by 1967 Conservation Needs Inventory for Upstream Watersheds								
Subtotal	25.0	407.6	--	66.4	499.0	--	--	--

STRUCTURAL MEASURES (continued)

Priority		ESTIMATED COSTS (MILLION) Plan'g. 1/ FS & SCS	Installation FS & SCS	Installation ASCS	Installation Others	Total	First Year Funding FS & SCS	First Year Funding ASCS	First Year Funding Others
All	Private Land	41.0	826.1	--	140.8	1,007.9	22.5	--	3.7
	State Forest	--	1.2	--	--	1.2	--	--	--
	National Forest	117.7	665.3	--	--	783.0	10.6	--	--
	Total Structural	158.7	1,492.6	--	140.8	1,792.1	33.1	--	3.7
	Total Land Treatment & Structural								
	Private Land	148.4	828.9	261.6	206.3	1,445.2	27.2	10.1	6.2
	State Forests	--	1.2	--	--	1.2	--	--	--
	National Forest	132.8	726.3	--	--	859.1	13.6	--	--
	Total	281.2	1,556.4	261.6	206.3	2,305.5	40.8	10.1	6.2

1/ FS - U. S. Forest Service
SCS - U. S. Soil Conservation Service
ASCS - Agricultural Stabilization and Conservation Service
Others - Landowners, operators, local watershed sponsors, and a portion may be financed through the various loan programs of the U. S. Farmers Home Administration

2/ Includes \$1.3 million for fire control for 12-county critical fire area in West Virginia and small amount for state land.

3/ Includes small amount on state lands.

The following listing of the 198 recommended feasible upstream watersheds provides some factors for determining priorities for detailed planning and installation. Factors listed include local sponsors' interest, potential of the watershed for industrial and multiple-purpose development and additional beneficial water storage, location of the watershed to designated growth centers and transportation and urban service facilities, size of potential labor pool, and availability and quality of land for improvement and development. In arriving at the adjective rating shown in the last three columns, a numerical value was assigned to each factor considered and a rating system developed. Information in this tabulation should be considered tentative and preliminary. A much more detailed analysis and survey will be needed at the time the watersheds are authorized for final detailed planning.

It should also be noted that some of the 100 upstream watersheds studied for the Appalachian Water Resource Survey and designated "Potential - WRS" in this Appendix were considered to be feasible if the benefit-cost ratio was at least 0.8:1. This was because of funding and time limitations, which made possible only a preliminary investigation of these watersheds and it was felt that a detailed investigation during the final planning would result in a B/C ratio of at least 1.0:1. This criteria was also used for determining feasibility of the 27 watersheds recommended from the Tombigbee River Basin Study. All other recommended watersheds have a B/C ratio of at least 1.0:1.

Watershed	State	Location No.	Local Sponsors' Interest 7/	POTENTIAL FOR Multiple Purpose Development 1/	Industrial Development 2/	Additional Beneficial Water Storage 3/
WATER SUB-REGION A						
Nescopeck	Pa.	42	H	X		
WATER SUB-REGION B						
Wills Creek	Pa.	73	H	X	X	X
Upper Casselman River 10/	Md.	2	H	X		X
Georges Creek	Md.	4	H			
Marsh Ditch	N. Y.	16	M	X		
Newtown-Hoffman Creek	N. Y.	17	M	X		
New Berlin	N. Y.	22	M	X		
Cayuga Inlet	N. Y.	20	M			X
Stony Creek 8/	Pa.	66	L		X	X
North Branch	Md.	P-3	L			
Town Creek	Md.	P-15	L			
Tonoloway	Md.	P-25	H			
Licking Creek	Md.	P-26	H	X		
North Fork South Branch 10/	W. Va.	P-10	M	X		
South Branch 10/	W. Va.	P-11	H	X		
Mill Creek 10/	W. Va.	P-12	M	X		
Little Cacapon River	W. Va.	P-19	L			
North River	W. Va.	P-20	M	X		
Lost River	W. Va.	P-22	H	X		
Sleepy Creek	W. Va.	P-24	L			
Opequon Creek	W. Va.	P-41	L	X		

Watershed	State	Location No.	In or Near Designated Growth Centers	Overall Quality & Availability of Land for Development 4/	Other Locational Advantages 5/	Size of Potential Labor Pool 6/
				7/	7/	7/
WATER SUB-REGION A						
Nescopeck	Pa.	42	X	L	M	M
WATER SUB-REGION B						
Wills Creek	Pa.	73	X	M	M	M
Upper Casselman River 10/	Md.	2	x	L	L	L
Georges Creek	Md.	4	X	L	M	L
Marsh Ditch	N. Y.	16	X	M	M	L
Newtown-Hoffman Creek	N. Y.	17	X	M	H	L
New Berlin	N. Y.	22	X	M	L	L
Cayuga Inlet	N. Y.	20	X	M	H	L
Stony Creek 8/	Pa.	66	X	M	H	M
North Branch	Md.	P-3	X	L	L	H
Town Creek	Md.	P-15	X	L	H	L
Tonoloway	Md.	P-25	X	L	M	M
Licking Creek	Md.	P-26	X	L	M	M
North Fork South Branch 10/	W. Va.	P-10	X	L	M	H
South Branch 10/	W. Va.	P-11	X	L	L	H
Mill Creek 10/	W. Va.	P-12	X	L	M	H
Little Cacapon River	W. Va.	P-19	X	M	L	H
North River	W. Va.	P-20	X	M	L	H
Lost River	W. Va.	P-22	X	L	L	H
Sleepy Creek	W. Va.	P-24	X	M	M	H
Opequon Creek	W. Va.	P-41	X	M	H	H

Watershed	State	Location No.	Local Sponsors' Interest 7/	POTENTIAL FOR: Multiple Purpose Development 1/	Industrial Development 2/	Additional Beneficial Water Storage 3/
WATER SUB-REGION C						
Back Creek 10/	Va.	10		X		X
Calfpasture River	Va.	13		X		X
Catawba Creek	Va.	8		X		X
Cowpasture River	Va.	7		X		X
Dunlap Creek	Va.	20		X		X
Jackson River 2 9/ 10/	Va.	31		X		X
Jackson River 5	Va.	34		X		X
Ogle Creek	Va.	47		X		X
Potts Creek	Va.	49		X		X
WATER SUB-REGION D						
Camp-Cane Creek	N. C.	8	H	X		X
North Oconee River 10/	Ga.	60	H	X		X
Cherokee Creek	S. C.	19	H	X		
North & Middle Tyger River	S. C.	22	H	X		
Turner Creek	N. C.	15	H			
Upper South Yadkin	N. C.	19	M	X		X
Eighteen Mile Creek 10/	S. C.	20	M	X		X
South Pacolet River	S. C.	23	M	X		
Little Beaver Dam 10/	S. C.	15	M			
Hunting-Bear Creek	N. C.	17	L			X

Watershed	State	Location No.	In or Near Designated Growth Centers	Overall Quality & Availability of Land for Development 4/	Other Locational Advantages 5/	Size of Potential Labor Pool 6/
				7/	7/	7/
WATER SUB-REGION C						
Back Creek 10/	Va.	10	X	L	L	M
Calfpasture River	Va.	13	X	M	L	M
Catawba Creek	Va.	8	X	L	M	M
Cowpasture River	Va.	7	X	L	L	M
Dunlap Creek	Va.	20	X	L	M	M
Jackson River 2 9/ 10/	Va.	31	X	L	L	M
Jackson River 5	Va.	34	X	L	H	M
Ogle Creek	Va.	47	X	L	L	M
Potts Creek	Va.	49	X	L	M	M
WATER SUB-REGION D						
Camp-Cane Creek	N. C.	8	X	M	L	L
North Oconee River 10/	Ga.	60	X	H	M	L
Cherokee Creek	S. C.	19	X	M	M	L
North & Middle Tyger River	S. C.	22	X	M	M	L
Turner Creek	N. C.	15	X	H	L	L
Upper South Yadkin	N. C.	19	X	M	L	M
Eighteen Mile Creek 10/	S. C.	20	X	M	M	L
South Pacolet River	S. C.	23	X	M	M	L
Little Beaver Dam 10/	S. C.	15	X	M	L	L
Hunting-Bear Creek	N. C.	17	X	M	L	L

Watershed	State	Location No.	Local Sponsors' Interest 7/	POTENTIAL FOR: Multiple Purpose Development 1/	POTENTIAL FOR: Industrial Development 2/	POTENTIAL FOR: Additional Beneficial Water Storage 3/
WATER SUB-REGION E						
Cahulga Creek	Ala.	20	H	X		
Tesnatee Creek	Ga.	56	H	X		
Line Creek	Miss.	27	H	X		
Hudson River	Ga.	46	H	X		
Luxapalila Creek	Ala.	34	H	X		X
Mahan Creek	Ala.	35	H	X		X
Suwanee Creek	Ga.	55	H			
Brown Creek	Miss.	26	H			
Dyne Creek	Ala.	28	H			X
Mill Creek	Ala.	38	H			X
Wehadkee Creek	Ala.	37	H			X
Wahoo-Little River 10/	Ga.	62	M	X		X
Mill Creek Area	Ga.	59	M	X		X
Young Cane Creek 10/	Ga.	63	M			X
Sipsey Creek	Ala.	22	M			X
Little Sandy Creek	Ala.	33	L	X		
Jacks & Socapotay	Ala.	30	L	X		
Scooba & Bodka Creek	Ala.	A-13, M-35				
Little Buttahatchia River	Ala.	A-18, M-21				
Yellow Creek	Ala.	A-20, M-24B				
Woolblank, Beaver, Blubber Creek	Ala.	A-25				
Lubbub Creek	Ala.	A-26				
New River & Barrow Creek	Ala.	A-27				

Watershed	State	Location No.	In or Near Designated Growth Centers	Overall Quality & Availability of Land for Development 4/ 7/	Other Locational Advantages 5/ 7/	Size of Potential Labor Pool 6/ 7/
WATER SUB-REGION E						
Cahulga Creek	Ala.	20	X	L	M	L
Tesnatee Creek	Ga.	56	X	M	L	M
Line Creek	Miss.	27	X	H	L	L
Hudson River	Ga.	46	X	M	M	M
Luxapalila Creek	Ala.	34	X	H	L	L
Mahan Creek	Ala.	35	X	M	L	L
Suwanee Creek	Ga.	55	X	H	M	L
Brown Creek	Miss.	26	X	H	L	L
Dyne Creek	Ala.	28	X	M	L	L
Mill Creek	Ala.	38	X	M	L	L
Wehadkee Creek	Ala.	37	X	M	M	L
Wahoo-Little River 10/	Ga.	62	X	M	M	M
Mill Creek Area	Ga.	59	X	M	L	L
Young Cane Creek	Ga.	63	X	M	L	M
Sipsey Creek	Ala.	22	X	H	L	L
Little Sandy Creek	Ala.	33	X	M	H	L
Jacks & Socapotay	Ala.	30	X	M	L	L
Scooba & Bodka Creek	Ala.	A-13, M-35	X	H	L	L
Little Buttahatchia River	Ala.	A-18, M-21	X	H	L	L
Yellow Creek	Ala.	A-20, M-24B	X	H	L	L
Woolblank, Beaver, Blubber Creek	Ala.	A-25		H	L	L
Lubbub Creek	Ala.	A-26		H	L	L
New River & Barrow Creek	Ala.	A-27	X	H	L	L

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Watershed	State	Location No.	Local Sponsors' Interest 7/	POTENTIAL FOR Multiple Purpose Development 1/	Industrial Development 2/	Additional Beneficial Water Storage 3/
WATER SUB-REGION E (continued)						
Twenty-Mile, Donovan Cr.	Miss.	M-2				
MacKay's Creek	Miss.	M-4				
Mantachie Creek	Miss.	M-7	H			
Reed Cummings	Miss.	M-8				
Bull Mountain Creek	Miss.	M-9, A-15				
Tallabinnela Creek	Miss.	M-11				
Cowpenna Creek	Miss.	M-12				
Mattubby & James Creek	Miss.	M-14				
Weanners & Stanefer Cr.	Miss.	M-15				
Hang Kettle & Town Creek	Miss.	M-19				
McKinley's Creek	Miss.	M-20				
Trim Cane Creek	Miss.	M-22	H			
Spring & Town Creek	Miss.	M-23				
Stinson Creek	Miss.	M-24				
Lower Luxapalila Creek	Miss.	M-24c, A-23a				
Catalpa Creek	Miss.	M-25				
Cypress & Talking Warrior	Miss.	M-26				
McCowers Creek	Miss.	M-27				
Ellis, Nash, & Kincade Cr.	Miss.	M-28, A-23				
Browning & W. Water Cr.	Miss.	M-31				
Bogue, Chitto & Woodward Creek	Miss.	M-32, M-34, A-14				

Watershed	State	Location No.	In or Near Designated Growth Centers	Overall Quality & Availability of Land for Development 4/	Other Locational Advantages 5/	Size of Potential Labor Pool 6/
				7/	7/	7/
WATER SUB-REGION E (continued)						
Twenty-Mile, Donovan Cr.	Miss.	M-2	X	H	L	L
MacKay's Creek	Miss.	M-4	X	H	L	L
Mantachie Creek	Miss.	M-7	X	H	L	L
Reed Cummings	Miss.	M-8	X	H	L	L
Bull Mountain Creek	Miss.	M-9, A-15	X	H	L	L
Tallabinnela Creek	Miss.	M-11	X	H	M	L
Cowpenna Creek	Miss.	M-12	X	H	L	L
Mattubby & James Creek	Miss.	M—14	X	H	M	L
Weanners & Stanefer Cr.	Miss.	M-15	X	H	M	L
Hang Kettle & Town Creek	Miss.	M-19	X	H	M	L
McKinley's Creek	Miss.	M-20	X	H	L	L
Trim Cane Creek	Miss.	M-22	X	H	M	L
Spring & Town Creek	Miss.	M-23	X	H	L	L
Stinson Creek	Miss.	M-24	X	H	M	L
Lower Luxapalila Creek	Miss.	M-24c, A-23a	X	H	M	L
Catalpa Creek	Miss.	M-25	X	H	M	L
Cypress & Talking Warrior	Miss.	M-26	X	H	M	L
McCowers Creek	Miss.	M-27	X	H	M	L
Ellis, Nash, & Kincade Cr.	Miss.	M-28, A-23	X	H	M	L
Browning & W. Water Cr.	Miss.	M-31	X	H	L	L
Bogue Chitto & Woodward Creek	Miss.	M-32, M-34, A-14	X	H	L	L

Watershed	State	Location No.	Local Sponsors' Interest 7/	POTENTIAL FOR Multiple Purpose Development 1/	POTENTIAL FOR Industrial Development 2/	POTENTIAL FOR Additional Beneficial Water Storage 3/
WATER SUB-REGION F						
Connoquenessing Creek 8/	Pa.	25	H	X	X	X
Sewickley Creek 8/	Pa.	64	H	X	X	
Kings Creek	W. Va.	81	H	X	X	X
Prickett Creek	W. Va.	85	H	X	X	X
Three Fork Creek	W. Va.	88	H	X	X	X
Short Creek	Ohio	8	H	X		
Jacobs Creek 10/	Pa.	33	H	X		
Stonecoal Creek	W. Va.	63	H	X		
Sugar Creek	Pa.	67	H	X		X
French Creek (Upper)	Pa.	56	M	X	X	X
Elk Creek	W. Va.	79	M	X	X	X
Limestone Run	W. Va.	82	M	X	X	X
Simpson Creek	W. Va.	87	M	X	X	X
Upper Middle Island Creek	W. Va.	89	M	X	X	X
Ten Mile Creek	W. Va.	64	M	X		
Little Valley 10/	N. Y.	15	M	X		X
Upper Loyalhanna Creek 8/	Pa.	71	M	X		X
Brokenstraw Creek 10/	Pa.	55	M	X		X
Raccoon Creek	Pa.	62	M	X		X
Indian Creek 10/	Pa.	57	M	X		X
LeBoeuf Creek	Pa.	58	M	X		X
Mahoning Creek 10/	Pa.	59	M	X		X
Paw Paw Creek	W. Va.	84	M	X		X

Watershed	State	Location No.	In or Near Designated Growth Centers	Overall Quality & Availability of Land for Development 4/ 7/	Other Locational Advantages 5/ 7/	Size of Potential Labor Pool 6/ 7/
WATER SUB-REGION F						
Connoquenessing Creek 8/	Pa.	25	X	H	H	L
Sewickley Creek 8/	Pa.	64	X	M	H	L
Kings Creek	W. Va.	81	X	M	M	L
Prickett Creek	W. Va.	85	X	L	H	M
Three Fork Creek	W. Va.	88	X	L	M	M
Short Creek	Ohio	8	X	M	H	L
Jacobs Creek 10/	Pa.	33	X	M	M	L
Stonecoal Creek	W. Va.	63	X	L	H	M
Sugar Creek	Pa.	67	X	M	M	L
French Creek (Upper)	Pa.	56	X	H	L	L
Elk Creek	W. Va.	79	X	L	H	M
Limestone Run	W. Va.	82	X	L	H	M
Simpson Creek	W. Va.	87	X	L	H	M
Upper Middle Island Creek	W. Va.	89	X	L	M	M
Ten Mile Creek	W. Va.	64	X	L	M	M
Little Valley 10/	N. Y.	15	X	M	M	L
Upper Loyalhanna Creek 8/	Pa.	71	X	M	M	L
Brokenstraw Creek 10/	Pa.	55	X	M	M	L
Raccoon Creek	Pa.	62	X	M	H	L
Indian Creek 10/	Pa.	57	X	M	M	L
LeBoeuf Creek	Pa.	58	X	H	M	L
Mahoning Creek 10/	Pa.	59	X	M	M	L
Paw Paw Creek	W. Va.	84	X	L	M	M

Watershed	State	Location No.	Local Sponsors' Interest 7/	POTENTIAL FOR Multiple Purpose Development 1/	Industrial Development 2/	Additional Beneficial Water Storage 3/
WATER SUB-REGION F (continued)						
Great Valley 10/	N. Y.	13	M			X
Blacklick Creek	Pa.	54	L	X	X	X
Tionesta Creek 10/	Pa.	68	L	X		X
Oswago Creek	Pa.	60	L	X		
Potato Creek 10/	Pa.	61	L	X		X
Turtle Creek	Pa.	69	L	X		X
West Branch Clarion R. 10/	Pa.	72	L	X		X
Sandy Creek	W. Va.	86	L	X		X
Sandy Lick Creek 10/	Pa.	63	L	X		X
Upper Allegheny River 10/	Pa.	70	L	X		X
WATER SUB-REGION G						
Little Salt Creek	Ohio	10	H	X	X	X
Federal Valley	Ohio	9	H	X	X	X
Mate Creek	W. Va.	83	H	X	X	X
Kanawha-Two Mile Creek	W. Va.	38	H	X		
Upper White Oak Creek	Ohio	14	H	X		X
Wolf Creek	Ohio	16	H	X		X
Little Scioto River	Ohio	11	H	X		X
Big Creek	W. Va.	92	H	X		X
Pine Creek	Ohio	7	H			
Elk-Two Mile Creek	W. Va.	29	H			

Watershed	State	Location No.	In or Near Designated Growth Centers	Overall Quality & Availability of Land for Development 4/ 7/	Other Locational Advantages 5/ 7/	Size of Potential Labor Pool 6/ 7/
WATER SUB-REGION F (continued)						
Great Valley 10/	N. Y.	13	X	M	H	L
Blacklick Creek	Pa.	54	X	M	H	L
Tionesta Creek	Pa.	68	X	M	M	L
Oswago Creek	Pa.	60	X	L	M	L
Potato Creek 10/	Pa.	61	X	M	L	L
Turtle Creek	Pa.	69	X	M	H	L
West Branch Clarion R. 10/	Pa.	72		L	M	L
Sandy Creek	W. Va.	86	X	L	L	M
Sandy Lick Creek 10/	Pa.	63		M	M	L
Upper Allegheny River	Pa.	70		L	M	L
WATER SUB-REGION G						
Little Salt Creek	Ohio	10	X	H	M	M
Federal Valley	Ohio	9	X	M	L	M
Mate Creek	W. Va.	83	X	L	M	H
Kanawha-Two Mile Creek	W. Va.	38	X	L	H	M
Upper White Oak Creek	Ohio	14	X	M	M	M
Wolf Creek	Ohio	16	X	M	L	M
Little Scioto River	Ohio	11	X	L	H	M
Big Creek	W. Va.	92	X	L	M	H
Pine Creek	Ohio	7	X	M	M	M
Elk-Two Mile Creek	W. Va.	29	X	L	H	M

Watershed	State	Location No.	Local Sponsors' Interest 7/	POTENTIAL FOR: Multiple Purpose Development 1/	Industrial Development 2/	Additional Beneficial Water Storage 3/
WATER SUB-REGION G (continued)						
Rocky Fork	W. Va.	59	H			
Upper Buckhannon River	W. Va.	93	M	X	X	X
Moxahala-Jonathan Creek	Ohio	12	M	X		X
Triplett Creek 8/	Ky.	22	M	X		X
East Fork Little Sandy	Ky.	16	M	X		X
Headwaters Holston River	Va.	76	M	X		X
French Creek	W. Va.	80	M	X		X
Fourpole Creek	W. Va.	32	L	X		
Slack Branch	W. Va.	61	L	X		
Wakatomika Creek	Ohio	15	L	X		X
Grassy Creek	Ky.	7	L	X		
O'Bannon Creek	Ohio	13	L	X		X
Little Fork of Little Sandy River	Ky.	8	M			
Little Stony Creek 9/ 10/	Va.	42		X		
Mill Creek 10/	Va.	74	H	X		
Peak Creek 10/	Va.	48		X		X
Ansted Creek	W. Va.	19		X		
Beaver Creek	W. Va.	21		X		
Grassy Creek	W. Va.	22				
Cherry River 10/	W. Va.	25		X		X
Georges Creek	W. Va.	31		X		
Glade Creek (Upper) 10/	W. Va.	33				
Howard Creek	W. Va.	36		X		

Watershed	State	Location No.	In or Near Designated Growth Centers	Overall Quality Availability of Land for Development 4/	Other Locational Advantages 5/	Size of Potential Labor Pool 6/
				7/	7/	7/
WATER SUB-REGION G (continued)						
Rocky Fork	W. Va.	59	X	L	M	M
Upper Buckhannon River	W. Va.	93	X	L	H	H
Moxahala-Jonathan Creek	Ohio	12	X	M	H	M
Triplett Creek 8/	Ky.	22	X	L	M	M
East Fork Little Sandy	Ky.	16	X	L	H	M
Headwaters Holston River	Va.	76	X	L	L	M
French Creek	W. Va.	80	X	L	H	H
Fourpole Creek	W. Va.	32	X	M	H	M
Slack Branch	W. Va.	61	X	L	L	M
Wakatomika Creek	Ohio	15	X	M	M	L
Grassy Creek	Ky.	7		L	L	M
O'Bannon Creek	Ohio	13	X	M	M	M
Little Fork of Little Sandy River	Ky.	8	X	L	M	M
Little Stony Creek 9/ 10/	Va.	42	X	L	M	M
Mill Creek 10/	Va.	74	X	L	M	M
Peak Creek 10/	Va.	48	X	L	M	M
Ansted Creek	W. Va.	19	X	L	L	H
Beaver Creek	W. Va.	21	X	L	L	H
Grassy Creek	W. Va.	22	X	L	L	H
Cherry River 10/	W. Va.	25	X	L	L	H
Georges Creek	W. Va.	31	X	L	H	M
Glade Creek (Upper) 10/	W. Va.	33	X	L	L	H
Howard Creek	W. Va.	36	X	L	H	H

Watershed	State	Location No.	Local Sponsors' Interest 7/	POTENTIAL FOR: Multiple Purpose Development 1/	Industrial Development 2/	Additional Beneficial Water Storage 3/
WATER SUB-REGION G (continued)						
Kellys Creek	W. Va.	39		X		
Lick Branch	W. Va.	31		X		
Meadow Creek	W. Va.	42				X
Mill Creek (Upper)	W. Va.	90	H	X		
Piney Creek 10/	W. Va.	52		X		
Slaughter Creek	W. Va.	78		X		
Tributary of Greenbrier (Gypsy Hill)	W. Va.	65		X		
Upper Meadow River 10/	W. Va.	72		X		
Wertz Hollow	W. Va.	31				
WATER SUB-REGION H						
Upper Howard Creek	Ky.	24	H	X		
Redlick Creek	Ky.	12	H	X		
Silver Creek	Ky.	21	M	X		X
Hanging Fork Creek	Ky.	17	L	X		X
Upper Red River	Ky.	23	L	X		X
WATER SUB-REGION I						
Roaring River	Tenn.	14	H	X		
Marrowbone Creek	Ky.	18	H	X		X

Watershed	State	Location No.	In or Near Designated Growth Centers	Overall Quality & Availability of Land for Development 4/	Other Locational Advantages 5/	Size of Potential Labor Pool 6/
				7/	7/	7/
WATER SUB-REGION G (continued)						
Kellys Creek	W. Va.	39	X	L	M	M
Lick Branch	W. Va.	31	X	L	H	M
Meadow Creek	W. Va.	42		L	L	H
Mill Creek (Upper)	W. Va.	90	X	L	M	L
Piney Creek 10/	W. Va.	52	X	L	H	H
Slaughter Creek	W. Va.	78	X	L	M	M
Tributary of Greenbrier (Gypsy Hill)	W. Va.	65	X	L	M	H
Upper Meadow River 10/	W. Va.	72		L	M	H
Wertz Hollow	W. Va.	31	X	L	H	M
WATER SUB-REGION H						
Upper Howard Creek	Ky.	24	X	M	M	M
Redlick Creek	Ky.	12	X	M	L	M
Silver Creek	Ky.	21	X	L	M	M
Hanging Fork Creek	Ky.	17	X	M	M	M
Upper Red River	Ky.	23		L	L	H
WATER SUB-REGION I						
Roaring River	Tenn.	14	X	M	H	L
Marrowbone Creek	Ky.	18	X	L	L	M

Watershed	State	Location No.	Local Sponsors' Interest 7/	POTENTIAL FOR Multiple Purpose Development 1/	Industrial Development 2/	Additional Beneficial Water Storage 3/
WATER SUB-REGION I (continued)						
Calfkiller River	Tenn.	21	H	X		X
Smith Fork Creek	Tenn.	15	M	X		
Putnam-Cane Creek	Tenn.	23	M	X		
Russell Creek	Ky.	20	M	X		X
Richland Creek	Ky.	19	M	X		X
Casey Creek	Ky.	15	M	X		X
Salt Lick Creek	Tenn.	28	M	X		
Marsh Creek 10/	Ky.	10	H	X		
WATER SUB-REGION J						
Sweetwater Creek 10/	Tenn.	16	H	X		
Horse Creek 10/	Tenn.	13	H	X		
Upper Clinch Valley	Va.	64	H	X		
Cypress Creek	Ala.	27	H	X		X
Limestone Creek	Ala.	31	H	X		X
Coahulla Creek	Tenn.	29	H	X		X
Headwaters Chattooga R. 10/	Ga.	58	H	X		X
Hickory Creek	Tenn.	12	H			
Boiling Fork Creek	Tenn.	9	H			
Cane Creek	Ala.	26	H			X
Bent Creek	Tenn.	17	M	X		X
Peavine Creek 10/	Ga.	61	M	X		X

Watershed	State	Location No.	In or Near Designated Growth Centers	Overall Quality & Availability of Land for Development 4/ 7/	Other Locational Advantages 5/ 7/	Size of Potential Labor Pool 6/ 7/
WATER SUB-REGION I (continued)						
Calfkiller River	Tenn.	21	X	M	M	L
Smith Fork Creek	Tenn.	15	X	M	L	L
Putnam-Cane Creek	Tenn.	23	X	M	H	L
Russell Creek	Ky.	20	X	M	L	M
Richland Creek	Ky.	19	X	L	M	H
Casey Creek	Ky.	15	X	M	L	M
Salt Lick Creek	Tenn.	28	X	M	L	L
Marsh Creek 10/	Ky.	10		L	L	M
WATER SUB-REGION J						
Sweetwater Creek 10/	Tenn.	16	X	M	M	L
Horse Creek 10/	Tenn.	13	X	M	H	L
Upper Clinch Valley	Va.	64	X	L	M	M
Cypress Creek	Ala.	27	X	H	L	L
Limestone Creek	Ala.	31	X	H	M	L
Coahulla Creek	Tenn.	29	X	H	H	L
Headwaters Chattooga R. 10/	Ga.	58	X	M	M	L
Hickory Creek	Tenn.	12	X	H	M	L
Boiling Fork Creek	Tenn.	9	X	M	M	L
Cane Creek	Ala.	26	X	M	L	L
Bent Creek	Tenn.	17	X	M	L	L
Peavine Creek 10/	Ga.	61	X	M	H	L

Watershed	State	Location No.	Local Sponsors' Interest 7/	POTENTIAL FOR: Multiple Purpose Development 1/	Industrial Development 2/	Additional Beneficial Water Storage 3/
WATER SUB-REGION J (continued)						
Bull Run Creek	Tenn.	20	M	X		X
Mountain Creek	Tenn.	26	M			X
Charles Creek	Tenn.	24	M			X
Cane Creek 10/	N. C.	7	L	X		
Little Bear Creek	Ala.	32	L			X
Tallulah Creek 9/ 10/	N. C.	18	H	X		X
Perkins Creek	Tenn.	27	M	X		
Blackwater Creek	Tenn.	18	M	X		X
Indian Creek 10/	Va.	71	M	X		X
Martin Creek 10/	Va.	72	M	X		X
Black Wolf Creek	Tenn.	19	L			X
Upper Bluestone River	Va.	6	H	X		X

1/ Potential project includes flood prevention and at least one other project purpose.

2/ Potential project will provide sufficient flood protection, and flood plain land is available to permit industrial, commercial, or residential development.

3/ Potential project can provide additional water storage over and above that for identified needs and project purposes.

4/ Factors evaluated included ratio of flood plain land and amount of land in Land Use Capability Classes V through VIII to the size of the watershed.

5/ Factors evaluated included relation to railroads, airports, Interstate or Appalachian Corridor Highways, and urban centers. Size of urban centers was also considered.

Watershed	State	Location No.	In or Near Designated Growth Centers	Overall Quality & Availability of Land for Development 4/ 7/	Other Locational Advantages 5/ 7/	Size of Potential Labor Pool 6/ 7/
WATER SUB-REGION J (continued)						
Bull Run Creek	Tenn.	20	X	M	M	L
Mountain Creek	Tenn.	26	X	M	L	L
Charles Creek	Tenn.	24	X	H	L	L
Cane Creek 10/	N. C.	7	X	L	L	L
Little Bear Creek	Ala.	32	X	M	M	L
Tallulah Creek 10/	N. C.	18	X	M	L	M
Perkins Creek	Tenn.	27		M	L	L
Blackwater Creek	Tenn.	18		M	L	L
Indian Creek 10/	Va.	71		L	M	H
Martin Creek 10/	Va.	72		L	L	H
Black Wolf Creek	Tenn.	19		M	L	L
Upper Bluestone River	Va.	6	X	L	M	M

6/ Factors evaluated included per cent of unemployment (1965) and population per worker.
7/ H = high; M = medium; L = low.
8/ Top priority in State Water Resource Supplement, January 1968.
9/ The Forest Service will make a detailed study and appraisal to supplement the proposed project before authorization for detailed planning is initiated.
10/ Located in or adjoining an Appalachian Regional Commission Highlands Recreation Area.

TABLE I

Land Use - Present and Expected - by Water Sub-Regions (1,000 acres)

Water Sub-Region	Cropland 1958	Cropland 1975	Pasture 1958	Pasture 1975	FOREST AND WOODLAND: State and Private 1958	FOREST AND WOODLAND: State and Private 1975	FOREST AND WOODLAND: National Forest 1958 2/	FOREST AND WOODLAND: National Forest 1975	Other Land 1958	Other Land 1975	Total 1958	Total 1975	Non-Agricultural Land 1/ 1958	Non-Agricultural Land 1/ 1975	Total
A	352.5	298.1	122.1	120.1	1,924.7	1,915.5	---	---	193.7	160.8	2,593.0	2,530.6	244.1	306.5	2,837.1
B	3,957.8	3,459.6	2,050.6	1,989.2	10,115.5	10,619.7	183.0	244.2	1,217.3	1,046.9	17,524.2	17,359.6	654.6	819.2	18,178.8
C	92.3	80.4	172.5	168.0	635.9	551.2	537.7	578.7	17.8	18.2	1,456.2	1,396.5	10.1	69.8	1,466.3
D	1,563.3	1,353.0	644.4	743.0	3,685.8	3,699.2	235.3	242.2	375.7	339.7	6,504.5	6,377.1	323.2	450.6	6,827.7
E	3,720.5	3,275.6	2,115.7	2,821.3	15,022.7	14,941.9	1,195.9	1,307.6	1,310.0	557.1	23,364.8	22,903.6	1,023.4	1,484.6	24,388.2
F	3,065.3	2,604.0	2,076.0	1,893.0	7,899.0	8,472.5	477.8	533.3	1,809.9	1,426.3	15,328.0	14,929.1	1,040.6	1,439.5	16,368.6
G	3,556.3	3,150.2	4,083.7	3,668.2	12,879.2	13,279.6	1,132.2	1,566.9	1,437.0	1,097.2	23,088.4	22,762.1	862.7	1,189.0	23,951.1
H	543.1	525.8	594.0	611.3	1,906.3	1,961.3	116.3	162.8	196.9	79.0	3,356.6	3,340.2	63.0	79.4	3,419.6
I	1,235.8	1,160.0	884.2	1,080.6	4,085.3	4,038.2	344.4	421.9	375.9	209.9	6,925.6	6,910.6	240.4	255.4	7,166.0
J	4,074.2	3,620.8	2,524.8	2,940.4	9,734.0	9,673.3	1,573.0	1,640.3	930.9	798.6	18,836.9	18,673.4	1,671.1	1,834.6	20,508.0
Total	22,161.1	19,527.5	15,268.0	16,035.3	67,888.4	69,188.4	5,795.6	6,697.9	7,865.1	5,733.7	118,978.2	117,182.8	6,133.2	7,928.6	125,111.4

1/ Includes federal land, 1,060,000 acres of federally-owned forest land other than national forests, urban, and built-up areas, water areas less than 40 acres and streams less than one-eighth mile wide.

2/ Based on June 30, 1966 data.

Source: National Inventory of Soil and Water Conservation Needs.

TABLE II

Area of Commercial Forest Land by Forest Type and Ownership 1962 (1,000 acres)

Forest Type	All Ownerships	National Forest	Other Public	Forest Industry	Farmer and Miscellaneous Private
Softwood types:					
Southern pines	9,390	697	222	1,065	7,406
White pine	1,626	101	155	94	1,276
Spruce-fir	87	33	3	4	47
Cedar	526	38	24	14	450
Subtotal	11,629	869	404	1,177	9,179
Hardwood types					
Oak-pine	5,873	527	179	589	4,578
Oak-hickory	41,235	2,879	2,283	2,365	33,708
Maple-birch-beech	8,820	803	750	452	6,815
Elm-ash-cottonwood	6,116	179	756	295	4,886
Oak-gum-cypress	1,606	66	41	180	1,319
Subtotal	63,650	4,454	4,009	3,881	51,306
Total	75,279	5,323	4,413	5,058	60,485

TABLE III

Area of Commercial Forest Land by Stand-Size and Ownership Classes, 1962 (1,000 acres)

Stand-size Class	All Ownerships	National Forest	Other Public	Forest Industry	Farmer and Miscellaneous Private
Sawtimber	33,576	3,417	2,022	2,219	25,918
Pole timber	21,241	1,397	1,430	1,407	17,007
Sapling and seedling	19,362	478	840	1,383	16,661
Non-stocked	1,100	31	121	49	899
Total	75,279	5,323	4,413	5,058	60,485

TABLE IV

Area of Commercial Forest Land by Stocking Classes Based on Alternative Stand Components, 1962 (1, 000 acres)

Stocking Percentage	All Trees	Growing Stock Trees	Desirable Trees
70 per cent or more	64, 404	39, 683	5, 960
40 to 70 per cent	8, 726	27, 950	22, 435
10 to 40 per cent	1, 863	6, 439	36, 427
Less than 10 per cent	286	1, 207	10, 457
Total	75, 279	75, 279	75, 279

TABLE V

Volume of Growing Stock and Sawtimber on Commercial Forest Land by Ownership Classes, 1962

Ownership Class	GROWING STOCK All Species	Soft Wood	Hard Wood	SAWTIMBER All Species	Soft Wood	Hard Wood
	Million cubic feet			Million board feet		
Public:						
National forest	6,058	1,370	4,688	16,377	4,950	11,427
Other public	4,798	519	4,279	8,835	1,265	7,570
Subtotal	10,856	1,889	8,967	25,212	6,215	18,997
Private:						
Forest industry	4,094	934	3,160	9,548	2,595	6,953
Farmer and Misc. private	44,281	7,030	37,251	108,054	18,594	89,460
Subtotal	48,375	7,964	40,411	117,602	21,189	96,413
Total	59,231	9,853	49,378	142,814	27,404	115,410

TABLE VI

Volume of Growing Stock and Sawtimber on Commercial Forest Land by Tree Diameter Groups, 1962

Tree Diameter Group	GROWING STOCK All Species	Soft Wood	Hard Wood	SAWTIMBER All Species	Soft Wood	Hard Wood
Inches	Million cubic feet			Million board feet		
6 - 8	17,956	3,728	14,228	---	---	---
10 - 12	19,047	3,301	15,746	40,751	13,401	27,350
14 - 16	12,175	1,777	10,398	53,406	8,621	44,785
18 +	10,053	1,047	9,006	48,657	5,382	43,275
Total	59,231	9,853	49,378	142,814	27,404	115,410

TABLE VII

Volume of Growing Stock and Sawtimber on Commercial Forest Land by Species, 1962

Species	Growing Stock	Sawtimber
	Million Cubic Feet	Million Board Feet
Softwood:		
Yellow pines	6, 950	18, 914
White pine	1, 292	4, 163
Hemlock	1, 390	3, 857
Spruce 1/	122	293
Red cedar	95	161
Cypress	4	16
Subtotal	9, 853	27, 404
Hardwood:		
Select white oaks	4, 995	12, 209
Select red oaks	5, 062	13, 614
Other white oaks	5, 830	13, 084
Other red oaks	5, 877	17, 430
Hickory	4, 105	10, 008
Ash	1, 328	2, 694
Yellow birch	714	1, 527
Hard maple	2, 845	5, 605
Soft maple	4, 378	5, 874
Beech	2, 189	6, 113
Sweetgum	523	1, 284
Black gum	765	2, 085
Basswood	956	2, 369
Yellow poplar	3, 617	10, 335
Black walnut	296	755
Black cherry	1, 729	3, 253
Other hardwoods	4, 169	7, 171
Subtotal	49, 378	115, 410
Total	59, 231	142, 814

1/ Includes balsam fir and other northern softwoods.

TABLE VIII

Net Annual Growth of Growing Stock on Commercial Forest Land by Water Sub-Region, 1962 and Projections to 1980, 2000, and 2020 (one million cubic feet)

Water Sub-Region	1962 All Species	1962 Soft Wood	1962 Hard Wood	1980 All Species	1980 Soft Wood	1980 Hard Wood	2000 All Species	2000 Soft Wood	2000 Hard Wood	2020 All Species	2020 Soft Wood	2020 Hard Wood
A	50	7	43	43	7	36	37	7	30	35	7	28
B	368	31	337	315	31	284	269	31	238	252	31	221
C	27	5	22	26	6	20	27	7	20	28	7	21
D	138	73	65	148	85	63	156	92	64	156	90	66
E	428	300	128	529	395	134	563	427	136	551	421	130
F	326	20	306	247	25	222	222	28	194	224	29	195
G	465	40	425	389	34	355	361	32	329	358	31	327
H	61	7	54	61	7	54	53	6	47	53	6	47
I	125	21	104	136	21	115	122	19	103	126	19	107
J	352	100	252	375	136	239	403	166	237	401	162	239
Total	2, 340	604	1, 736	2, 269	747	1, 522	2, 213	815	1, 398	2, 184	803	1, 381

TABLE IX

Annual Cut of Growing Stock on Commercial Forest Land by Water Sub-Region, 1962 and Projections to 1980, 2000, and 2020 (one million cubic feet)

Water Sub-Region	1962 All Species	1962 Soft Wood	1962 Hard Wood	1980 All Species	1980 Soft Wood	1980 Hard Wood	2000 All Species	2000 Soft Wood	2000 Hard Wood	2020 All Species	2020 Soft Wood	2020 Hard Wood
A	15	6	9	20	7	13	25	7	18	35	7	28
B	129	30	99	161	30	131	203	30	173	252	31	221
C	12	1	11	17	2	15	29	6	23	37	8	29
D	88	54	34	108	63	45	163	87	76	193	103	90
E	210	135	75	307	209	98	567	408	159	667	480	187
F	86	8	78	116	10	106	196	22	174	247	27	220
G	138	12	126	177	16	161	319	28	291	405	31	374
H	14	2	12	21	3	18	46	6	40	59	6	53
I	55	8	47	66	10	56	116	17	99	130	18	112
J	200	62	138	256	79	177	424	149	275	518	187	331
Total	947	318	629	1, 249	429	820	2, 088	760	1, 328	2, 543	898	1, 645

TABLE X

Inventory of Growing Stock on Commercial Forest Land by Water Sub-Region, 1962 and Projections to 1980, 2000, and 2020 (one million cubic feet)

Water Sub-Region	1962 All Species	1962 Soft Wood	1962 Hard Wood	1980 All Species	1980 Soft Wood	1980 Hard Wood	2000 All Species	2000 Soft Wood	2000 Hard Wood	2020 All Species	2020 Soft Wood	2020 Hard Wood
A	1,727	268	1,459	2,319	286	2,033	2,729	293	2,436	2,919	293	2,626
B	11,071	1,128	9,943	12,200	1,129	11,071	16,934	1,132	15,802	17,904	1,133	16,771
C	838	143	695	1,070	199	871	1,128	239	889	992	231	761
D	3,009	1,181	1,828	3,885	1,538	2,347	4,285	1,838	2,447	3,760	1,752	2,008
E	7,091	3,466	3,625	10,547	6,072	4,475	13,395	8,710	4,685	12,079	8,263	3,816
F	9,650	641	9,009	13,710	892	12,818	15,344	1,097	14,247	15,373	1,192	14,181
G	13,090	777	12,313	19,031	1,303	17,728	22,008	1,438	20,570	21,948	1,490	20,458
H	1,234	102	1,132	2,209	218	1,991	2,773	282	2,491	2,757	288	2,469
I	2,755	389	2,366	4,271	667	3,604	5,290	826	4,464	5,297	845	4,452
J	8,766	1,758	7,008	11,483	2,616	8,867	12,584	3,456	9,128	11,618	3,367	8,251
Total	59,231	9,853	49,378	80,725	14,920	65,805	96,470	19,311	77,159	96,647	18,854	75,793

TABLE XI

Volume and Value of Timber Products Output by Water Sub-Region, 1962 and Projections to 1980, 2000, and 2020

Water Sub-Region	Sawlogs, veneer logs, and miscellaneous industrial products 1962	1980	2000	2020	Pulpwood 1962	1980	2000	2020	Fuelwood 1962	1980	2000	2020
					Volume - million cubic feet							
A	12	14	18	22	1	1	2	3	3	1	1	1
B	65	65	73	83	49	78	114	136	25	19	12	8
C	1	1	1	1	11	20	34	42	1	1	Negligible	
D	59	58	90	108	26	36	55	66	17	10	7	4
E	89	127	240	283	92	163	304	360	10	11	8	5
F	52	67	106	116	18	38	83	130	19	15	10	7
G	89	113	206	220	23	46	115	176	18	21	16	11
H	9	16	35	44	1	1	4	8	4	4	4	3
I	36	49	86	93	6	9	21	28	5	5	4	3
J	113	127	216	264	51	91	158	194	22	18	12	8
Total	525	637	1,071	1,234	278	483	890	1,143	124	105	74	50
					Value - thousand dollars							
A	3,461	4,284	5,449	7,012	140	270	418	603	861	531	480	349
B	21,365	21,359	24,563	27,802	9,976	15,224	21,857	26,005	8,558	6,573	4,240	2,827
C	180	150	222	272	2,030	3,512	6,167	7,693	273	143	99	65
D	19,916	19,383	30,309	36,254	4,824	7,254	10,767	12,928	5,551	3,356	2,180	1,392
E	30,774	43,889	82,355	96,938	19,567	34,334	64,283	75,986	3,501	3,644	2,520	1,712
F	17,745	22,910	35,739	38,989	3,360	6,878	15,000	23,458	6,515	4,979	3,388	2,252
G	30,262	38,415	70,300	75,010	4,566	9,196	22,672	34,669	6,055	7,207	5,616	3,640
H	1,821	2,994	6,728	8,555	94	248	797	1,402	1,352	1,664	1,560	1,144
I	6,971	9,528	16,596	18,006	1,166	1,793	3,972	5,221	1,803	1,803	1,248	832
J	38,993	43,681	72,213	88,167	9,693	16,885	29,370	36,254	7,613	6,271	3,941	2,787
Total	171,488	206,593	344,474	397,005	55,416	95,594	175,303	224,219	42,082	36,171	25,272	17,000

TABLE XII

Total United States Population, Employment, Gross National Product, and Personal and Per Capita Income, Selected Years 1940-60, with Projections to 1980, 2000, and 2020

Years	Population 1/	Employment 2/	Gross National Product 3/	Personal Income 3/	Per Capita Income 3/
	Millions	Millions	Million $	Million $	$
1940	132.6	47.5	100	78	595
1950	152.3	59.7	285	226	1,496
1960	180.7	66.4	440	352	1,955
1967	200.0	--	--	--	--
1980	245.3	94.8	1,001	785	3,200
2000	338.2	130.6	2,144	1,680	4,967
2020	469.1	181.2	4,686	3,630	7,738

1/ Includes Armed Forces abroad.
2/ Census of Population concept, excludes those stationed overseas.
3/ 1954 dollars.
Source: (1) 1940-50 data, Statistical Abstract of the United States.
(2) 1960-2020 data, Office of Business Economics, U. S. Department of Commerce.

TABLE XIII

Per Capita Use of Major Farm Products in the United States, Selected Years 1940-65 (pounds)

Years	Meat	Poultry	Eggs	Dairy Products Including Butter	Fruits	Vegetables
1940	135.9	17.5	38.7	382	172.0	232.7
1945	140.9	25.5	48.4	451	167.1	262.3
1950	137.8	25.1	48.5	407	150.5	214.7
1955	152.2	26.7	46.9	407	143.4	202.7
1960	146.7	34.7	42.4	385	141.9	199.9
1965	148.2	41.1	39.1	373	128.9	196.7

Source: U. S. Food Consumption Bulletin No. 364, 1909-1963, with Supplement for 1965.

TABLE XIV

Index of Total Production of Major Farm Products in the United States, 1959-61, with Projections to 1980, 2000, and 2020

Commodity Group	1959-61	1980	2000	2020
Feed Crops	100	113	126	137
Food Crops	100	133	182	253
Oil and Fiber Crops	100	139	180	236
Livestock and Livestock Products	100	120	165	228

Source: Unpublished Economic Research Service data.

TABLE XV

Projections of Indexes of Production Requirements, Selected Products, Appalachian Region, 1980, 2000, and 2020
(1959-61=100)

Commodity	1980	2000	2020
Feed grains	121	143	172
Meat	132	167	214
Poultry	155	190	243
Milk	104	129	163
Non-citrus fruits	116	153	198
Vegetables	140	174	221

Source: Unpublished Economic Research Service data.

TABLE XVI

Crop Yields, Selected Areas and Crops, Appalachian Region, 1960 and Projected to 1980 and 2010 (per acre)

Crops and Land Resource Areas	1960	1980	2010
Corn, bushel:			
LRA 125 1/	51	60	81
128 2/	44	62	79
Alfalfa, tons:			
LRA 125	2.3	2.8	3.4
128	2.0	2.7	3.3
Pasture, animal-unit days annually:			
LRA 125	121	140	160
128	75	96	123

1/ Cumberland Plateau and Mountains.
2/ Southern Appalachian Ridges and Valleys.
Source: Unpublished Economic Research Service data.

TABLE XVII

Sale of All Farm Products, Selected Years, 1949-64, by Water Sub-Region, with Projections to 1980, 2000, and 2020, All Adjusted by Wholesale Commodity Price Index (1957-59=100) ($1, 000)

Water Sub-Region	Sale of All Farm Products						
	1949	1954	1959	1964	1980	2000	2020
A	38, 837	39, 689	37, 156	43, 823	51, 329	56, 420	68, 494
B	351, 404	344, 685	382, 926	412, 081	537, 509	587, 309	714, 783
C	7, 048	7, 781	8, 874	7, 445	7, 197	7, 062	6, 963
D	93, 939	109, 063	128, 816	150, 324	191, 802	210, 977	256, 126
E	235, 481	290, 981	370, 963	532, 563	540, 508	604, 542	735, 693
F	212, 189	203, 559	217, 576	244, 796	306, 188	336, 516	408, 530
G	218, 221	207, 350	207, 657	214, 084	271, 700	298, 298	362, 132
H	58, 788	50, 179	57, 970	61, 436	77, 789	85, 583	103, 897
I	71, 400	71, 836	89,356	104, 175	130, 228	144, 106	174, 955
J	234, 586	229, 542	296, 114	344, 363	427, 001	480, 060	582,793
Total	1, 521, 893	1, 554, 665	1, 797, 408	2, 115, 090	2,541,251	2, 810, 873	3, 414, 366
Per cent of U. S. 1/ Total	5. 8	5. 9	5. 9	6. 1	5. 8	4. 8	4. 4
U. S. 1/ Total	26, 417, 253	26, 517, 726	30, 341, 251	34, 939, 063	43, 821, 500	58, 559, 978	77, 599, 034

1/ For conterminous 48 states only. U. S. data adjusted also.
Source: (1) 1949-64 data, U. S. Census of Agriculture.
(2) Projections, unpublished Economic Research Service data.

TABLE XVIII

Major Crops and Livestock Enterprises by Water Sub-Regions, 1964

Water Sub-Region	All Corn	Cotton	Wheat	Oats	Tobacco	Commercial Vegetables	Irish Potatoes	Orchards and Vineyards	Land Cut for Hay 1/	Clover Timothy Hay	Lespedeza	Alfalfa & Alfalfa Mixtures	Small Grain Hay
	Crops												
	Acres												
A	38,626	--	11,685	21,845	--	5,594	3,569	3,447	146,773	88,135	---	23,177	2,579
B	477,387	--	150,438	334,786	197	23,973	21,547	67,862	1,664,766	840,547	375	554,537	21,989
C	6,063	--	983	646	--	66	72	2,364	41,037	15,623	754	8,105	2,259
D	117,473	48,056	42,042	26,407	3,663	4,797	689	32,702	197,483	51,360	42,686	9,546	30,332
E	729,619	569,742	46,274	32,447	8,159	21,166	4,570	64,569	367,882	46,398	71,622	7,615	43,254
F	253,009	--	65,860	229,203	--	18,777	10,949	43,568	1,102,144	598,659	507	375,672	8,194
G	469,512	--	142,872	69,832	10,475	5,960	4,454	20,044	1,086,063	608,104	13,964	278,153	32,884
H	60,665	--	2,789	757	--	185	382	1,187	146,326	63,257	32,482	29,755	6,209
I	177,793	--	6,340	6,962	31,975	8,572	1,349	2,753	365,819	103,797	173,556	38,627	23,909
J	455,824	263,898	53,842	31,871	44,491	28,824	4,950	29,940	823,309	329,975	175,576	97,065	74,980
Total	2,785,971	753,428	523,125	754,756	98,960	117,914	52,531	268,436	5,941,602	2,745,855	511,522	1,422,252	246,589
Per cent of U.S. 2/ Total	4.4	5.4	1.1	4.0	9.6	3.5	4.4	6.3	9.4	20.5	21.8	5.0	8.8

Livestock Enterprises

Water Sub-Region	Cattle and Calves	Milk Cows	Chickens 4 mos. old & older	Hogs and Pigs	Sheep and Lambs
	Number on farms				
A	89,564	49,306	1,498,605	17,536	3,966
B	1,220,788	608,365	7,028,195	175,983	141,518
C	39,604	4,963	100,509	5,373	27,696
D	290,961	56,457	3,745,577	70,167	8,234
E	1,620,274	173,101	10,628,962	457,251	9,444
F	840,604	324,717	3,650,641	107,924	162,061
G	1,080,743	232,281	4,048,295	407,698	307,672
H	239,203	34,356	398,719	59,974	23,989
I	491,362	112,785	1,044,344	222,461	20,949
J	1,246,662	253,320	5,437,356	333,441	56,086
Total	7,159,765	1,849,651	37,581,193	1,857,808	761,615
Per cent of U.S. Total	6.8	12.7	11.0	3.4	3.0

1/ 1959 data for this crop only. Other hay crops are 1964 data.
2/ For conterminous 48 states only.
Source: U. S. Census of Agriculture.

TABLE XIX

Volume of Farm Output by Water Sub-Region, 1964

Water Sub-Regions	Crops: Corn Harvested for Grain	Cotton	Wheat	Oats	Tobacco	Potatoes	Clover Timothy Hay	Lespedeza	Alfalfa and Alfalfa Mixture	Small Grain Hay
	1,000 Bushel	1,000 Pounds	1,000 Bushel	1,000 Bushel	1,000 Pounds	1,000 Bushel	Tons	Tons	Tons	Tons
A	1,177		330	886	5	918	118,756		43,727	3,422
B	13,283		4,302	15,335	256	6,630	1,064,744	286	1,037,260	31,489
C	156		29	23		13	14,182	550	14,090	2,429
D	3,894	26,335	1,056	1,003	6,860	190	59,119	47,919	18,069	36,401
E	23,371	329,174	1,360	1,378	13,816	826	67,935	98,250	13,363	60,827
F	11,979		1,871	12,021		3,557	952,606	533	810,926	12,338
G	23,380		3,626	3,322	17,254	1,023	751,758	14,036	535,392	38,036
H	2,816		73	29		86	83,411	39,018	64,721	7,597
I	8,916		160	277	65,878	331	132,510	217,608	84,414	28,422
J	17,138	157,574	1,380	1,328	95,135	914	412,163	210,021	206,897	100,624
Total	106,110	355,633	14,187	35,604	199,204	14,486	3,657,184	628,221	2,828,859	321,595
Per cent of U. S. 1/ Total	3.2	4.8	1.2	4.4	10.0	3.9	18.7	20.3	4.1	8.8

Water Sub-Region	Livestock Enterprises: Whole Milk Sold	Cream Sold	Chickens Sold 2/	Chicken Eggs Sold	Hogs and Pigs Sold Alive	Calves Sold Alive	Sheep and Lambs Sold Alive
	1,000 lbs.	Pounds	Number	Dozens	Number	Number	Number
A	410,013	32,026	3,568,016	21,006,804	26,080	31,724	2,931
B	5,256,084	604,432	36,165,098	87,643,354	255,633	437,021	16,841
C	24,615	44,338	2,327,991	1,005,878	5,476	15,386	27,285
D	258,527	27,898	49,120,673	48,797,328	175,669	78,566	6,031
E	730,137	17,028	260,031,671	130,167,851	527,866	438,920	6,545
F	2,519,176	833,133	9,128,784	45,004,241	152,950	254,901	107,325
G	1,308,100	752,744	12,358,022	44,016,673	633,384	328,857	248,505
H	131,054	18,554	921,415	2,065,055	87,961	82,205	24,287
I	416,747	42,171	12,435,883	6,043,086	357,228	188,917	18,233
J	1,172,757	99,621	60,948,508	60,400,042	427,343	415,741	52,083
Total	12,227,212	2,471,985	447,006,061	446,150,312	2,649,590	2,272,238	610,066
Per cent of U. S. 1/ Total	11.4	1.9	27.6	10.4	3.2	8.0	2.8

1/ For conterminous 48 states only.
2/ These are 1959 data.
Source: U. S. Census of Agriculture.

TABLE XX-A

Estimated Acreage and Cost of Accelerated Land Treatment Measures for Private Forestry by Water Sub-Regions for 10-Year Period 1/

Water Sub-Region	Management Plans	Tree Planting		Erosion Control		Harvest Cuttings		Hydrologic Stand Improvement		Grazing Control		Other Technical Assistance Cost	Total	
		Area	Instal. & Tech. Asst. Cost	Area	Instal. & Tech. Asst. Cost	Area	Instal. & Tech. Asst. Cost	Area	Instal. & Tech. Asst. Cost	Area	Instal. & Tech. Asst. Cost		Area	Instal. & Tech. Asst. Cost
	(No.)	(Ac.)	($)	(Ac.)	($)	(Ac.)	($)	(Ac.)	($)	(Ac.)	($)	($)	(Ac.)	($)
A	450	3,000	165,000	120	2,400	1,800	16,200	6,800	163,200	1,800	7,500	67,200	13,520	421,500
B	2,830	71,500	3,114,000	660	145,000	29,500	246,000	31,000	1,298,000	41,300	126,200	479,800	173,960	5,409,000
C	90	3,000	77,100	1,000	34,200	---	37,100	9,500	57,800	9,500	30,700	8,100	23,000	245,000
D	1,800	159,000	4,086,300	79,000	2,701,800	168,000	597,400	107,200	1,712,000	118,000	383,500	306,100	631,200	9,787,100
E	6,700	712,000	18,223,900	392,000	7,406,000	385,000	1,463,000	599,000	9,324,000	661,000	2,111,500	1,138,800	2,749,000	39,667,200
F	1,980	33,000	1,551,000	440	8,700	17,300	155,200	24,300	902,100	35,300	132,800	326,400	110,340	3,076,200
G	5,520	86,300	2,814,600	19,760	667,800	515,300	2,079,700	552,000	9,154,000	191,300	683,900	931,200	1,364,660	16,331,200
H	580	55,800	1,424,100	61,600	2,106,600	25,500	96,800	47,600	761,600	66,300	215,400	98,900	256,800	4,703,400
I	1,220	83,600	2,148,500	118,000	4,035,300	68,300	259,400	119,500	1,911,900	147,100	478,000	207,800	536,500	9,040,900
J	1,980	170,700	4,385,900	44,500	1,579,500	153,200	590,400	286,600	4,495,400	151,100	485,900	336,900	806,100	11,874,000
Total	23,150	1,377,900	37,990,400	717,080	18,687,300	1,363,900	5,541,200	1,783,500	29,780,000	1,422,700	4,655,400	3,901,200	6,655,080	100,555,500

1/ Thousand dollars. Price base 1966.

TABLE XX-B

Estimated Cost of Accelerated Land Treatment Measures on Private Forests by States for a 10-Year Period 1/

States	Tree Planting		Erosion Control		Harvest Cuttings		Hydrologic Stand Improvement		Grazing Control		Other	Total		Summation
	Tech. Assist.	Instal.	Tech. Assist.	Instal.	Tech. Assist.	Instal.	Tech. Assist.	Instal.	Tech. Assist.	Instal.	Tech. Assist.	Tech. Assist. 2/	Instal.	
Alabama	471.0	7,595.8	252.0	4,218.2	378.6	399.0	570.7	4,144.1	114.0	539.4	471.5	2,257.8	16,896.5	19,154.3
Georgia	670.2	10,812.5	512.0	2,243.2	314.8	331.7	461.3	2,893.8	93.9	543.2	536.7	2,588.9	16,824.4	19,413.3
Kentucky	248.5	4,169.7	359.4	5,786.2	740.7	780.9	1,046.9	6,567.4	133.6	656.0	634.9	3,164.0	17,960.2	21,124.2
Maryland	20.0	110.0	49.0	87.0	8.0	2.0	20.0	60.0	0.2	1.2	30.4	127.6	260.2	387.8
Mississippi	7.5	1,205.0	141.7	2,286.1	114.7	120.9	100.8	2,263.2	164.4	807.3	295.9	825.0	6,682.5	7,507.5
New York	450.0	2,850.0	1.0	3.9	186.0	62.0	364.0	840.0	21.3	85.0	420.4	1,442.7	3,840.9	5,283.6
North Carolina	173.7	2,802.4	42.0	676.2	231.6	220.7	266.6	1,672.5	53.7	263.7	191.9	959.5	5,635.5	6,595.0
Ohio	60.0	500.0	---	---	90.0	20.0	52.5	350.0	5.5	30.0	126.8	334.8	900.0	1,234.8
Pennsylvania	160.0	720.0	2.2	6.6	60.2	17.2	247.2	495.6	3.4	32.4	248.6	721.6	1,271.8	1,993.4
South Carolina	94.5	1,524.6	32.0	515.2	101.7	107.3	74.8	469.2	21.5	105.3	112.5	437.0	2,721.6	3,158.6
Tennessee	90.1	1,454.4	62.2	1,000.3	166.8	175.9	365.2	2,290.8	62.4	306.4	187.1	933.8	5,227.8	6,161.6
Virginia	39.6	638.9	23.0	370.3	345.3	400.2	488.4	2,971.0	50.3	242.7	236.9	1,183.5	4,623.1	5,806.6
West Virginia	264.0	858.0	4.4	13.2	132.0	33.0	264.0	440.0	16.5	302.1	407.6	1,088.5	1,646.3	2,734.8
Total	2,749.1	35,241.3	1,480.9	17,206.4	2,870.4	2,670.8	4,322.4	25,457.6	740.7	3,914.7	3,901.2	16,064.7	84,490.8	100,555.5

1/ Thousand dollars. Price Base 1966.
2/ Includes development of individual forest management plans, stimulation of landowner interest and participation, and supervision and inspection of the program.

TABLE XXI-A

Estimated Cost of Accelerated Land Treatment Measures for National Forests by Water Sub-Regions for 10-Year Period

Measures	Units	B No.	B Cost. 1/	C No.	C Cost	D No.	D Cost	E No.	E Cost	F No.	F Cost
Timber											
Tree planting	Ac.	27,970	1,677.9	144,390	8,663.2	11,130	667.5	161,100	9,546.1	17,000	1,224.0
Timber stand improvement	Ac.	22,620	457.3	149,700	2,986.8	14,850	295.4	274,950	5,489.4	37,200	178.4
Subtotal			2,135.2		11,650.0		962.9		15,035.5		1,402.4
Water Yield											
Improvement by Vegetative Mgt.	Ac.	10,000	40.0							20,000	100.0
Subtotal			40.0								100.0
Soil and Water											
Gully Stabilization	Ac.	10	6.0	710	356.0	420	208.0	200	100.8	10	3.0
Sheet Erosion Control	Ac.	20	1.0	1,680	252.0			150	21.2	300	11.0
Streambank stabilization	Ac.	10	2.0	250	315.0			380	470.5	60	452.0
Stream channel clearing	Ac.	10	5.0	950	95.0	690	68.6	450	44.6	10	2.0
Rehab. abandoned roads & trails	Ac.	20	3.5	510	25.4	1,980	99.0	10,300	515.2	80	14.5
Mined area stabilization	Ac.			10	14.4	10	3.6	10	7.2	10	1.5
Pollution abatement	Ac.									880	400.0
Subtotal			17.5		1,057.8		379.2		1,159.5		884.0
Soil Surveys	Ac.	200,000	20.0	527,000	78.8	150,000	45.0	1,450,000	435.0	700,000	70.0
Subtotal			20.0		78.8		45.0		435.0		70.0
Watershed analysis	Ac.	150,000	12.0	300,000	90.0	200,000	60.0	1,800,000	540.0	300,000	70.0
Subtotal			12.0		90.0		60.0		540.0		70.0
Range Management	Ac.	1,720	200.5								
Subtotal			200.5 2/								
Fire Protection											
Fuel Treatment (disposal)	Ac.										
Subtotal											
Fish and Wildlife											
Big game range analysis	Ac.					148,000	3.7	320,000	8.0	454,500	45.4
Small game range analysis	Ac.	80,000	4.3	494,100	12.4	43,600	1.0	385,000	9.6	85,000	8.5
Wildlife openings	Ac.	2,100	126.6			6,600	495.0	3,500	131.3	16,300	911.3
Seeding and planting	Ac.	1,600	38.8	1,450	43.5	140	4.1	4,100	122.9	7,500	156.8
Release of forage plants	Ac.	1,600	53.7	1,200	30.0			4,400	110.0		
Planting waterfowl food plants	Ac.			40	1.6			40	1.6	400	9.2
Stream and lake surveys	Ac.	320	11.8	21,000	101.2	3,600	3.6	15,300	161.2	300	15.6
Subtotal			235.2		188.7		507.4		544.6		1,146.8
Total			2,660.4		13,065.3		1,954.5		17,714.6		3,673.2

1/ Thousand dollars. Price base 1966.

2/ Includes cattle guard, fencing, water developments, etc.

TABLE XXI-A (continued)

Estimated Cost of Accelerated Land Treatment Measures for National Forests by Water Sub-Regions for 10-Year Period

Measures	Units	G		H		I		J		Total	
		No.	Cost 1/	No.	Cost	No.	Cost	No.	Cost	No.	Cost
Timber											
Tree planting	Ac.	8,900	553.7	2,130	127.9	20,630	1,237.8	183,090	10,985.2	576,340	34,683.3
Timber stand improvement	Ac.	65,230	1,320.8	18,590	378.2	78,910	1,588.4	264,750	5,121.2	926,890	17,815.9
Subtotal			1,874.5		506.1		2,826.2		16,106.4		52,499.2
Water Yield											
Improvement by Vegetative Mgt.	Ac.	50,000	150.0							80,000	290.0
Subtotal			150.0								290.0
Soil and Water											
Gully stabilization	Ac.	40	33.0	290	144.0	1,000	502.0	490	246.0	3,170	1,598.8
Sheet erosion control	Ac.	40	4.0	810	121.5	2,530	379.5	6,810	1,021.5	12,340	1,811.7
Streambank stabilization	Ac.	480	240.0	410	515.0	1,700	2,125.0	40	53.6	3,330	4,173.1
Stream channel clearing	Ac.	710	367.0	170	16.6	670	66.8	4,400	440.0	8,060	1,105.6
Rehab. abandoned roads & trails	Ac.	360	64.0	460	23.2	1,860	93.0	10,480	524.0	26,050	1,361.8
Pollution abatement	Ac.	490	243.0							1,370	643.0
Mined area stabilization	Ac.	1,270	636.0	750	906.0	1,520	1,828.8	140	165.6	3,720	3,563.1
Subtotal			1,587.0		1,726.3		4,995.1		2,450.7		14,257.1
Soil Surveys	Ac.	1,000,000	90.0	62,000	18.6	200,000	60.0	1,500,000	450.0	5,789,000	1,267.4
Subtotal			90.0		18.6		60.0		450.0		1,267.4
Watershed Analysis	Ac.	1,000,000	150.0	150,000	45.0	300,000	90.0	1,200,000	360.0	5,400,000	1,417.0
Subtotal			150.0		45.0		90.0		360.0		1,417.0
Range Management	Ac.	720	206.2							2,440	406.7
Subtotal			206.2								406.7
Fire Protection											
Fuel treatment (disposal)	Ac.	36,500	18.6							36,500	18.6
Subtotal			18.6								18.6
Fish and Wildlife											
Big game range analysis	Ac.	142,300	3.6			172,000	4.3			1,236,800	65.0
Small game range analysis	Ac.	153,300	14.5	50,000	1.3	172,000	4.3	138,400	3.5	1,601,400	59.4
Wildlife openings	Ac.	31,900	1,816.9	2,200	109.4	8,700	217.1	13,000	129.5	84,300	3,937.1
Seeding and planting	Ac.	20,300	429.9			2,800	84.9	1,900	56.7	39,790	937.6
Release of forage plants	Ac.	10,000	169.6	900	21.8	3,500	86.0	600	14.8	22,200	485.9
Planting waterfowl food plants	Ac.	200	5.9	150	6.2			30	1.2	860	25.7
Stream and lake surveys	Ac.	400	4.3	120	1.2			4,600	47.2	45,640	346.1
Subtotal			2,444.7		139.9		396.6		252.9		5,856.8
Total			6,521.0		2,435.9		8,367.9		19,620.0		76,012.8

TABLE XXI-B

Estimated Cost of Accelerated Structural Program for National Forests by Water Sub-Regions for 10-Year Period

Measures	Units	B		C		D		E		F	
		No.	Costs 1/	No.	Costs	No.	Costs	No.	Costs	No.	Costs
Fire Protection											
1. Firebreak construction	Miles	5	2.8					12	1.2		
2. Fire weather stations	No.	1	0.5							1	0.5
3. Lookout towers	No.									1	15.6
4. Heliports	No.										
5. Helispots	No.										
6. Air tanker bases	No.										
Subtotal			3.3						1.2		16.1
Fish and Wildlife											
1. Waterhole development	Ac.	100	11.8	50	9.9			200	24.0	580	362.5
2. Potholes for waterfowl	Ac.			10	0.5					30	0.6
3. Impoundments for waterfowl	Ac.			50	240.0			100	500.0	100	5.2
4. Stream and lake habitat improvement	Ac.	400	86.8	5,600	378.1	4,200	126.0	4,360	210.8	1,600	166.4
5. Small impoundments	No.									100	5.2
Subtotal			98.6		628.5		126.0		734.8		539.9
Recreation											
1. Recreation facilities	Ac.	700	6,645.0			240	1,950.9	1,430	3,771.4	1,300	6,284.0
2. Recreational impoundments	Ac.	315	664.0							1,950	4,888.0
3. Special recreation projects 2/	No.	4	17,347.0	3	9,500.0	4	2,500.0	6	23,650.0	2	8,420.0
Subtotal			24,656.0		9,500.0		4,450.9		27,421.4		19,592.0
Transportation											
1. Road construction	Mi.	19	910.0	59	2,650.0	15	600.0	435	18,670.0	800	21,000.0
2. Roadside developments	Ac.	400	12.0							400	400.0
3. Observation sites	No.	7	106.4							27	212.8
4. Trail construction	Mi.	24	43.2	21	70.0	5	16.0	150	500.0		
5. Bridges (roads and trails)	No.	2	127.7							100	3,192.0
Subtotal			1,199.3		2,720.0		616.0		19,170.0		24,804.8
Land Adjustments											
1. Acquisition	Ac.	7,200	576.3	130,000	8,500.0	130,000	1,790.0	128,200	12,633.2	128,300	13,076.5
Subtotal			576.3		8,500.0		1,790.0		12,633.2		13,076.5
Total			26,533.5		21,348.5		6,982.9		59,960.6		58,029.3

1/ Thousand dollars. Price base 1966.
2/ Such as Mount Rogers and Spruce Knob-Seneca Rocks National Recreation Areas.

TABLE XXI-B (continued)

Estimated Cost of Accelerated Structural Program for National Forests by Water Sub-Regions for 10-Year Period

Measures	Units	G No.	G Costs 1/	H No.	H Costs	I No.	I Costs	J No.	J Costs	Total No.	Total Costs
Fire Protection											
1. Firebreak construction	Mi.	208	117.3							225	121.3
2. Fire weather stations	No.	2	1.0							4	2.0
3. Lookout towers	No.			3	60.0					4	75.6
4. Heliports	No.			1	8.0	3	24.0			4	32.0
5. Helispots	No.			200	100.0	500	300.0			700	400.0
6. Air tanker bases	No.							2	62.0	2	62.0
Subtotal			118.3		168.0		324.0		62.0		692.9
Fish and Wildlife											
1. Waterhole development	Ac.	100	10.0	50	5.1	200	20.0	70	7.0	1,350	450.3
2. Potholes for waterfowl	Ac.	160	3.1							200	4.2
3. Impoundments for waterfowl	Ac.	10	0.5							260	745.7
4. Stream and lake habitat improvement	Ac.	1,000	670.6	60	1.7	330	66.7	4,250	193.4	21,800	1,900.5
5. Small impoundments	Ac.									100	5.2
Subtotal			684.2		6.8		86.7		200.4		3,105.9
Recreation											
1. Recreation facilities	Ac.	3,000	10,937.5	610	1,324.3	2,870	9,421.9	5,580	39,872.4	15,730	80,207.4
2. Recreational impoundments	Ac.	1,565	5,620.0					220	330.0	4,050	11,502.0
3. Special recreation projects 2/	No.	18	76,938.5	4	38,400.0	4	38,000.0	8	53,850.0	53	268,605.5
Subtotal			93,496.0		39,724.3		47,421.9		94,052.4		360,314.9
Transportation											
1. Road construction	Mi.	1,666	56,800.0	656	27.0	726	29,750.0	606	25,450.0	4,982	155,857.0
2. Roadside developments	Ac.	2,760	660.0							3,560	1,072.0
3. Observation sites	No.	52	532.0							86	851.2
4. Trail construction	Mi.	767	2,595.0	216	720.0	242	800.0	202	670.0	1,627	5,414.2
5. Bridges (roads and trails)	No.	162	5,107.2							264	8,426.9
Subtotal			65,694.2		747.0		30,550.0		26,120.0		171,621.3
Land Adjustments											
1. Acquisition	Ac.	1,267,200	155,149.4	275,000	16,500.0	250,000	15,000.0	338,500	24,050.0	2,654,400	247,275.4
Subtotal			155,149.4		16,500.0		15,000.0		24,050.0		247,275.4
Total			315,142.1		57,146.1		93,382.6		144,484.8		783,010.4

1/ Thousand dollars. Price base 1966.

2/ Such as Mount Rogers and Spruce Knob-Seneca Rocks National Recreation Areas.

TABLE XXI-C

Recommended Accelerated Land Treatment Measures and Installation Costs for State and Private Lands by Water Sub-Regions for 10-Year Period

Measure	Units	A		B		C		D	
		No.	Costs ($)	No.	Costs ($)	No.	Costs ($)	No.	Costs ($)
Cropland	Acres	640	14,870	304,650	7,308,630	3,500	63,110	37,420	1,085,600
Grassland									
Improvement	Acres	7,080	86,020	230,150	1,887,570	15,000	123,000	55,400	470,990
Establishment	Acres	2,830	34,380	66,880	589,370	6,000	49,200	88,060	780,640
Critical Area Stabilization									
Roadbank	Acres	410	143,500	6,320	2,171,500	770	269,500	7,980	2,558,500
Surface-Mined Area	Acres	50,100	5,010,000	31,480	3,070,060	180	9,540	80	6,000
Recreation and Wildlife									
Farm Ponds	No.	22	8,600	784	335,400	14	4,300	76	30,100
Fish Pond Management	No.	70	4,540	1,450	93,930	90	5,830	1,710	110,810
Planting	Acres	920	184,000	2,250	2,250,000	10	2,000	1,720	344,000
Recreation Access Roads	Miles	57	1,040,440	274	5,014,850	3	62,460	58	1,057,140
Wildlife Habitat Development	Acres	9,010	648,720	20,420	1,470,240	200	14,400	4,110	295,920
Wildlife Habitat Preservation	Acres	52,410	104,820	116,150	232,300	120	240	8,060	16,120
Picnic Areas	Acres	2,080	3,224,480	4,890	7,580,640	30	46,510	3,740	5,797,870
Camping Areas	Acres	800	4,003,710	1,950	9,759,040	10	50,050	1,500	7,597,380
Private Forest and Woodland									
Tree Planting	Acres	3,000	165,000	71,500	3,114,000	3,000	77,100	159,000	4,086,300
Erosion Control	Acres	120	2,400	660	145,000	1,000	34,200	79,000	2,701,800
Harvest Cutting	Acres	1,800	16,200	29,500	246,000	--	37,100	168,000	597,400
Hydrologic Stand Improvement	Acres	6,800	163,200	31,000	1,298,000	9,500	57,800	107,200	1,712,000
Woodland Grazing Control	Acres	1,800	7,500	41,300	126,200	9,500	30,700	118,000	383,500
Management Plans	No.	450	67,200	2,830	479,800	90	8,100	1,800	306,100
Soil Surveys	Acres	--	--	2,252,040	790,000	1,185,790	920,000	799,150	210,000
Basic Conservation Plans	No.	2,060	490,000	13,670	3,630,000	300	90,000	2,160	510,000
State Forests									
Tree Planting	Acres	--	--	4,260	231,500	--	--	--	--
Erosion Control	Acres	--	--	1,500	27,600	--	--	--	--
Harvest Cutting	Acres	--	--	14,020	94,400	--	--	--	--
Woodland Grazing Control	Acres	--	--	1,600	3,040	--	--	--	--
Hydrologic Stand Improvement	Acres	--	--	20,430	633,130	--	--	--	--
Management Plans	No.	--	--	215	42,930	--	--	--	--
Total Installation Costs			15,419,580		52,625,130		1,955,140		30,658,170

TABLE XXI-C (continued)

Recommended Accelerated Land Treatment Measures and Installation Costs for State and Private Lands by Water Sub-Regions for 10-Year Period

Measure	Units	E No.	E Costs ($)	F No.	F Costs ($)	G No.	G Costs ($)	H No.	H Costs ($)
Cropland	Acres	2,139,400	16,888,490	115,880	3,785,150	200,550	6,581,650	87,240	1,306,860
Grassland									
Improvement	Acres	169,300	2,761,580	211,900	1,681,750	515,480	3,477,390	146,520	964,100
Establishment	Acres	202,520	2,408,140	29,900	268,620	120,800	704,350	171,700	1,129,790
Critical Area Stabilization									
Roadbank	Acres	45,350	15,872,500	6,490	2,271,500	16,350	5,722,500	1,460	438,000
Surface-Mined Area	Acres	2,110	158,250	108,380	9,178,500	84,250	4,785,790	9,670	512,500
Recreation and Wildlife									
Farm Ponds	No.	656	283,800	325	137,600	579	249,400	730	313,900
Fish Pond Management	No.	8,020	519,700	1,160	75,190	4,600	298,080	260	16,830
Planting	Acres	370	74,000	2,930	586,000	3,550	711,000	140	28,000
Recreation Access Roads	Miles	99	1,810,650	103	1,884,240	178	3,256,630	--	--
Wildlife Habitat Development	Acres	36,120	2,600,640	20,300	1,461,600	18,490	1,331,280	6,620	476,640
Wildlife Habitat Preservation	Acres	417,010	834,020	113,790	227,580	142,190	284,380	14,740	29,480
Picnic Areas	Acres	820	1,271,190	6,360	9,859,470	7,720	11,967,790	310	480,570
Camping Areas	Acres	330	1,651,530	2,540	12,711,790	3,080	15,434,310	120	600,560
Private Forest and Woodland									
Tree Planting	Acres	712,000	18,223,900	33,000	1,551,000	86,300	2,841,600	55,800	1,424,100
Erosion Control	Acres	392,000	7,406,000	440	8,700	19,760	667,800	61,600	2,106,600
Harvest Cutting	Acres	385,000	1,463,000	17,300	155,200	515,300	2,079,700	25,500	96,800
Hydrologic Stand Improvement	Acres	599,000	9,324,000	24,300	902,100	552,000	9,154,000	47,600	761,600
Woodland Grazing Control	Acres	661,000	2,111,500	35,300	132,800	191,300	683,900	66,300	215,400
Management Plans	No.	6,700	1,138,800	1,980	326,400	5,520	931,200	580	98,900
Soil Surveys	Acres	4,029,240	1,030,000	1,570,320	610,000	7,095,750	3,280,000	13,489,840	6,560,000
Basic Conservation Plans	No.	12,330	2,850,000	12,840	3,030,000	22,070	4,770,000	11,500	2,950,000
State Forests									
Tree Planting	Acres	--	--	240	8,550	--	--	--	--
Erosion Control	Acres	--	--	100	600	--	--	--	--
Harvest Cutting	Acres	--	--	2,780	18,900	7,000	70,000	--	--
Hydrologic Stand Improvement	Acres	--	--	6,770	210,870	7,000	224,000	--	--
Woodland Grazing Control	Acres	--	--	200	630	--	--	--	--
Management Plans	No.	--	--	19	2,510	7	5,600	--	--
Total Installation Costs			90,681,690		51,087,250		79,485,350		20,510,630

TABLE XXI-C (continued)

Recommended Accelerated Land Treatment Measures and Installation Costs for State and Private Lands by Water Sub-Regions for 10-Year Period

Measure	Units	I		J		Region Total	
		No.	Costs ($)	No.	Costs ($)	No.	Costs ($)
Cropland	Acres	138,840	2,272,770	146,410	3,498,070	3,174,530	42,805,200
Grassland							
Improvement	Acres	376,460	2,634,610	221,920	1,537,840	1,949,210	15,624,850
Establishment	Acres	373,640	2,633,960	166,320	1,232,190	1,228,650	9,830,640
Critical Area Stabilization							
Roadbank	Acres	4,410	1,543,500	23,330	8,165,500	112,870	39,156,500
Surface-Mined Area	Acres	28,620	1,531,600	19,620	1,091,560	334,490	25,353,800
Recreation and Wildlife							
Farm Ponds	No.	604	258,000	921	395,600	4,711	2,016,700
Fish Pond Management	No.	1,090	70,680	2,450	158,740	20,900	1,354,330
Planting	Acres	2,470	494,000	1,140	228,000	15,500	4,901,000
Recreation Access Roads	Miles	36	654,860	50	913,480	858	15,694,750
Wildlife Habitat Development	Acres	4,150	298,800	9,360	673,920	128,780	9,272,160
Wildlife Habitat Preservation	Acres	46,000	92,000	4,400	8,800	914,870	1,829,740
Picnic Areas	Acres	5,370	8,324,750	2,570	3,984,070	33,890	52,537,340
Camping Areas	Acres	2,140	10,709,930	990	4,954,600	13,460	67,472,900
Private Forest and Woodland							
Tree Planting	Acres	83,600	2,148,500	170,700	4,385,900	1,377,900	37,990,400
Erosion Control	Acres	118,000	4,035,300	44,500	1,579,500	717,080	18,687,300
Harvest Cutting	Acres	68,300	259,400	153,200	590,400	1,363,900	5,541,200
Hydrologic Stand Improvement	Acres	119,500	1,911,900	286,600	4,495,400	1,783,500	29,780,000
Woodland Grazing Control	Acres	147,100	478,000	151,100	485,900	1,422,700	4,655,400
Management Plans	No.	1,220	207,800	1,980	336,900	23,150	3,901,200
Soil Surveys	Acres	12,295,130	5,970,000	2,353,800	1,560,000	45,071,420	20,930,000
Basic Conservation Plans	No.	14,720	3,710,000	13,030	3,100,000	104,680	25,130,000
State Forests							
Tree Planting	Acres	--	--	--	--	4,500	240,050
Erosion Control	Acres	--	--	--	--	1,600	28,200
Harvest Cutting	Acres	--	--	--	--	23,800	183,300
Hydrologic Stand Improvement	Acres	--	--	--	--	34,200	1,068,000
Woodland Grazing Control	Acres	--	--	--	--	1,800	3,670
Management Plans	No.	--	--	--	--	241	51,040
Total Installation Costs			50,240,360		43,376,370		436,039,670

TABLE XXII

Estimated Employment in Timber-Based Manufacturing Industries, 1962, by Water Sub-Regions, and Projections to 1980, 2000, and 2020 (Number)

Water Sub-Region	1962			1980			2000			2020		
	Total	Lumber and Wood Products	Pulp, paper & allied Products	Total	Lumber and Wood Products	Pulp, paper & allied Products	Total	Lumber and Wood Products	Pulp, paper & allied Products	Total	Lumber and Wood Products	Pulp, paper & allied Products
A	1,768	902	866	1,873	791	1,082	1,667	638	1,029	1,437	534	903
B	15,140	6,680	8,460	13,246	4,921	8,325	11,011	3,693	7,318	8,100	2,812	5,288
C	2,306	113	2,193	2,523	119	2,404	2,630	132	2,498	1,993	109	1,884
D	5,804	3,735	2,069	4,389	2,541	1,848	4,339	2,655	1,684	3,369	2,144	1,225
E	15,404	9,911	5,493	15,904	9,730	6,174	19,379	12,436	6,943	14,875	9,909	4,966
F	8,408	2,448	5,960	9,790	2,429	7,361	11,421	2,761	8,660	9,505	1,906	7,599
G	13,652	8,384	5,268	14,441	8,083	6,358	19,023	10,468	8,555	15,061	7,707	7,354
H	976	976	--	1,212	1,212	--	1,914	1,914	--	1,809	1,809	--
I	4,022	4,014	8	4,139	4,132	7	5,087	5,078	9	4,107	4,100	7
J	18,901	9,037	9,864	18,241	7,065	11,146	19,753	8,133	11,620	15,398	6,737	8,661
Total	86,381	46,200	40,181	85,728	41,023	44,705	96,224	47,908	48,316	75,654	37,767	37,887

TABLE XXIII

Present (1960) and Projected Rural and Rural Farm Population to 1970, 1980, and 2000 by Water Sub-Region (number)

Water Sub-Region	1960		1970		1980		2000	
	Rural	Rural Farm	Rural	Rural Farm	Rural	Rural Farm	Rural	Rural Farm
A	245,452	20,804	256,579	9,456	276,049	6,696	294,825	3,924
B	1,235,418	201,576	1,379,063	86,748	1,612,542	61,440	1,819,731	35,964
C	40,755	7,826	39,146	3,912	40,108	2,760	40,935	1,620
D	728,672	132,098	958,341	63,480	1,297,769	44,964	1,592,334	26,328
E	1,346,152	346,384	1,614,388	164,724	2,073,686	116,640	2,514,588	68,280
F	1,724,069	158,803	1,856,447	87,696	2,043,101	62,100	2,215,461	36,360
G	1,804,278	283,204	1,943,745	148,920	2,169,505	105,456	2,373,475	61,740
H	217,704	65,281	231,130	31,680	271,752	22,440	312,314	13,140
I	424,644	161,982	387,581	77,640	411,392	54,960	431,388	32,184
J	1,579,970	418,999	1,761,132	194,064	2,174,612	137,424	2,626,945	80,460
Totals	9,347,114	1,796,957	10,427,552	868,320	12,370,516	614,880	14,221,996	360,000

Source: (1) 1960 data, U. S. Census of Population.
(2) Projections, unpublished Economic Research Service data.

TABLE XXIV

Present (1960) and Projected Agricultural Employment to 1980, 2000, and 2020 by Water Sub-Region (number of workers)

Water Sub-Region	1960	1980	2000	2020
A	7,381	4,020	3,840	3,660
B	58,971	37,485	33,023	32,238
C	1,939	1,000	750	760
D	33,619	14,390	9,256	8,369
E	47,087	14,323	6,670	3,771
F	44,429	22,065	16,789	16,388
G	56,949	23,979	16,081	12,886
H	15,348	6,958	4,335	3,536
I	34,862	15,338	10,210	8,175
J	89,527	37,402	24,695	19,135
Total	390,112	176,960	125,829	108,918

Source: Economic Basic Study by Office of Business Economics, U. S. Department of Commerce.

TABLE XXV

Existing Conservation Treatment by Water Sub-Regions 1/

Items 2/	Reporting Code	Units	A	B	C	D	E	F	G	H	I	J	Total
			Water Sub-Regions										
District Cooperators	100	No.	2,778	29,303	1,476	24,496	66,619	28,483	56,197	9,582	21,138	37,234	277,306
Basic Conservation Plans	108-112	No.	2,267	21,606	1,123	21,451	57,725	21,393	40,267	6,510	15,255	25,167	212,764
	116	Ac.	357,903	3,754,869	226,818	1,927,874	7,493,932	2,671,755	5,653,831	716,826	1,665,944	2,952,781	27,422,533
Soil Survey	180-184 188-196	Ac.	1,481,922	12,651,466	215,865	5,141,877	18,449,261	10,911,652	13,580,742	2,027,146	3,476,648	11,900,829	79,837,408
Land Adequately Treated	690	Ac.	653,858	2,848,182	698,487	2,298,712	6,218,967	1,603,847	3,634,722	361,365	733,252	1,759,896	20,811,288
LAND TREATMENT MEASURES													
Cropland													
Cons. Cropping System	328	Ac.	49,994	575,387	31,158	493,409	912,199	509,668	1,123,525	105,785	220,939	586,985	4,609,049
Diversion	362	Ft.	1,121,584	17,575,618	36,326	1,576,385	7,661,327	9,731,020	4,856,786	2,380,733	3,474,286	1,994,758	50,408,823
Irrigation Water Mgt.	449	Ac.	114	1,073	265	7,202	2,516	16	178	278	1,225	10,082	22,949
Drainage:													
Field Ditch	480	Ft.	139,867	5,179,969	471,659	3,002,398	41,617,737	3,657,464	10,550,176	1,336,428	4,334,297	14,583,101	84,873,096
Mains & Laterals	590	Ft.											
Tile Drain	606	Ft.	771,052	14,313,350	149,913	1,469,689	1,731,458	22,271,533	26,087,225	3,390,189	3,835,099	4,680,387	78,699,895
Strip Cropping	585-586	Ac.	43,239	312,906	4,301	17,494	3,469	311,855	309,964	543	5,571	37,230	1,046,572
Stream Channel Improvement	582	Ft.	8,210	1,334,372	23,582	504,925	2,642,248	1,072,408	2,855,026	157,806	668,681	1,086,168	10,353,426
Pasture													
Management	510	Ac.	21,085	260,433	5,982	283,502	995,446	172,242	480,566	193,396	269,678	517,127	3,199,45[illegible]
Renovation	511	Ac.	7,896	456,223	26,001	194,515	409,983	245,631	1,114,196	170,552	304,135	582,396	3,511,52[illegible]
Planting	512	Ac.	20,169	286,540	32,629	551,175	1,953,653	173,278	648,583	258,471	754,136	1,420,077	6,098,711
Farm Pond	378	No.	386	10,799	841	7,415	48,961	8,780	24,266	12,489	20,027	26,771	160,735
Spring Development	574	No.	24	1,980	413	539	547	5,555	11,804	996	2,502	2,617	26,977
Woodland													
Critical Area Planting	342	Ac.	239	3,386	907	41,950	282,779	34,162	23,247	1,898	6,732	36,897	432,197
Tree Planting	612	Ac.	27,233	252,612	2,012	180,878	863,185	362,432	187,712	36,323	107,276	202,875	2,222,538
Harvest Cutting	654	Ac.	4,412	154,133	24,922	98,551	412,993	122,228	322,139	6,168	137,382	188,006	1,470,934
Improvement Practices	656-600 662-666	Ac.	7,881	145,993	19,731	178,354	1,738,907	142,596	415,612	26,391	147,365	268,178	3,091,008
Wildlife													
Habitat Preservation	643	Ac.	15,366	249,855	151	2,405	324,362	130,876	243,562	2,374	26,566	16,196	1,011,713
Habitat Development	644-645	Ac.	5,707	92,727	945	17,852	124,977	122,095	60,338	3,625	18,222	21,355	467,843
Recreation													
Recreational Enterprises	230	No.	93	377	22	458	1,421	349	188	17	37	145	3,107
Fish Pond Management	399	No.	168	1,375	69	3,186	11,343	1,004	3,981	256	585	4,378	26,345
Area Planting and Stabilization	561-562	Ac.	708	2,400	10	1,008	1,346	1,822	1,437	211	2,026	2,654	13,622

1/ As of June 30, 1967. 2/ Selected key items and measures. Source: Soil Conservation Service data.

TABLE XXVI - A

Upstream Watersheds - Completed Projects 1/
Structural Measures

Watershed Name	State	Project Area	Number of Structures	Drainage Area Controlled	STORAGE VOLUME BY PURPOSE: Sediment	Flood-water	M & I Water Supply	Recrea-tion	Fish & Wild-life	Irriga-tion	Total	Channel Improve-ment	ESTIMATED INSTALLATION COST: Land Treat-ment	Structural Measures	Flood-plain Area
		(Sq. Mi.)	(No.)	(Sq. Mi.)	(Ac. Ft.)	(Ac. Ft.)	(Ac. Ft.)	(Ac. Ft.)	(Ac. Ft.)	(Ac. Ft.)	(Ac. Ft.)	(Miles)	($1,000)	($1,000)	(Acres)
WATER SUB-REGION A															
None															
WATER SUB-REGION B															
Dean Creek	N.Y.	9.88													350
Great Brook	N.Y.	26.20	1	1.93		216					216	0.3	203.7	50.0	943
Cory Creek	Pa.	24.10											277.6	6.3	799
Warm Springs Run	W. Va.	11.35	9	2.00	25	295					320		150.5	245.9	248
Total		71.53	10	3.93	25	511					536	0.3	631.8	302.2	2,340
WATER SUB-REGION C															
None															
WATER SUB-REGION D															
Barber Creek	Ga.	42.03	4	11.09	408	2,109					2,517	10.9	375.3	244.5	2,100
Marbury Creek	Ga.	25.62	3	12.6	361	3,391	1,200		1,918		6,870	13.1	324.2	533.0	1,300
Brushy Creek	S.C.	36.74	4	11.88	373	3,093					3,466	5.3	383.1	337.9	610
Huff Creek	S.C.	34.04	5	22.98	761	5,888					6,649	1.1	206.6	389.7	998
Twelve Mile Cr.	S.C.	105.23	7	34.65		8,705					8,705	23.2	639.4	955.9	4,692
Total		243.66	23	93.2	1,903	23,186	1,200		1,918		28,207	53.6	1,928.6	2,461.0	9,700
WATER SUB-REGION E															
Bristows Creek	Ala.	25.95	2	5.60	183	1,125				550	1,858	7.7	277.1	187.6	2,462
Little New River	Ala.	50.79	3	12.03	329	3,020					3,349		238.9	154.5	1,127
High Pine Cr.	Ala.	80.61	9	27.40	836	6,267	500				7,603	19.18	472.0	530.3	3,495
Amicalola Cr.	Ga.	125.46	4	15.95	286	3,123					3,409		321.1	226.8	650

TABLE XXVI - A (continued)

Upstream Watersheds - Completed Projects - Structural Measures

Watershed Name	State	Project Area	Number of Structures	Drainage Area Controlled	STORAGE VOLUME BY PURPOSE: Sediment	Flood-water	M & I Water Supply	Recrea-tion	Fish & Wild-life	Irriga-tion	Total	Channel Improve-ment	ESTIMATED INSTALLATION COST: Land Treat-ment	Structural Measures	Flood-plain Area
		(Sq. Mi.)	(No.)	(Sq. Mi.)	(Ac. Ft.)	(Ac. Ft.)	(Ac. Ft.)	(Ac. Ft.)	(Ac. Ft.)	(Ac. Ft.)	(Ac. Ft.)	(Miles)	($1,000)	($1,000)	(Acres)
WATER SUB-REGION E (continued)															
Hazel Creek	Ga.	30.56	4	8.08	179	1,611	150				1,940	9.43	226.8	249.0	1,265
Hightower Cr.	Ga.	35.86	4	6.29	102	740					842	9.80	131.8	297.0	510
Jacks River	Ga.	123.84	No Treatment Needed												
Mill Creek	Ga.	50.94	6	23.43	396	4,298	1,048				5,742	17.30	191.0	482.6	2,200
North Fork Broad River	Ga.	63.43	12	23.60	647	5,152					5,799	36.0	818.0	832.0	4,000
Sautee Creek	Ga.	31.25	5	11.00	383	2,324		270			2,977	7.74	174.9	305.6	933
Settingdown Cr.	Ga.	53.23	15	29.30	416	6,349					6,765	25.20	265.3	617.1	3,600
Shammack Cr.	Miss.	16.52	5	5.89	360	1,855					2,215	10.70	128.5	350.6	4,533
Total		688.44	69	168.57	4,117	35,864	1,698	270		550	42,499	143.05	3,245.4	4,233.5	24,775
WATER SUB-REGION F															
Mill Run	Pa.	12.21	2	8.77	134	2,871			3,786		6,791		50.3	546.6	110
N. Fr. Cow-anesque River	Pa.	11.95	1	3.40	41	626					667		65.4	198.3	460
Saul-Mathay Run	Pa.	6.16	2	2.97	29	585					614		83.4	209.7	100
Salem Fork-Ten Mile Cr.	W. Va.	8.32	8	3.04	181	496					677	4.0	145.8	219.2	247
Upper Grave Cr.	W. Va.	7.69	7	2.00	34	389	77				500	3.6	126.4	364.7	132
Total		46.33	20	20.18	419	4,967	77		3,786		9,249	7.6	471.3	1,538.5	1,049
WATER SUB-REGION G															
Back Creek	Va.	34.91										11.1	285.1	24.8	1,002
Bonds Creek	W. Va.	14.74	1	0.51	11	86			147		244	5.8	106.2	261.9	333
Dave's Fork Christian's Fork	W. Va.	6.49	3	2.4	43	502					545	1.2	23.0	242.3	
Marlin Run	W. Va.	1.62	1	1.2	15	272					287		6.4	156.4	
Total		57.76	5	4.1	69	860			147		1,076	18.1	420.7	685.4	1,335

TABLE XXVI - A (continued)
Upstream Watersheds - Completed Projects - Structural Measures

Watershed Name	State	Project Area	Number of Structures	Drainage Area Controlled	STORAGE VOLUME BY PURPOSE: Sediment	Flood-water	M & I Water Supply	Recrea-tion	Fish & Wild-life	Irriga-tion	Total	Channel Improve-ment	ESTIMATED INSTALLATION COST: Land Treat-ment	Structural Measures	Flood-plain Area
		(Sq. Mi.)	(No.)	(Sq. Mi.)	(Ac. Ft.)	(Ac. Ft.)	(Ac. Ft.)	(Ac. Ft.)	(Ac. Ft.)	(Ac. Ft.)	(Ac. Ft.)	(Miles)	($1,000)	($1,000)	(Acres)
WATER SUB-REGION H															
Red River (Still-water Creek)	Ky.	24.35										6.4	147.6	355.8	336
Upper Green R.	Ky.	37.93	5	3.67	76	646					722	12.0	324.7	330.2	1,538
Total		62.28	5	3.67	76	646					722	18.4	472.3	686.0	1,874
WATER SUB-REGION I															
Meadow Creek	Ky.	15.41										7.3	261.7	234.9	1,336
Proctor Creek	Tenn.	13.23										5.3	53.3	67.4	430
Total		28.64										12.6	315.0	302.3	1,766
WATER SUB-REGION J															
Clear Creek	Ala.	18.44	----------	----------	----------	No data available	----------	----------	----------	----------	----------	----------	----------	----------	----------
Little Paint Cr.	Ala.	55.63	2	6.8	92	1,157					1,249	22.4	227.7	447.0	3,360
Total		74.07	2	6.8	92	1,157					1,249	22.4	227.7	447.0	3,360
Grand Total		1,272.71	134	300.45	6,701	67,191	2,975	270	5,851	550	83,538	276.05	7,712.8	10,665.9	46,199

1/ As of June 30, 1967.

TABLE XXVI-A(1)

Summary - Upstream Watersheds - Completed Projects - Structural Measures

Water Sub-Region	Project Area	Number of Structures	Drainage Area	Storage Volume by Purpose: Sediment	Floodwater	M & I Water Supply	Recreation	Fish and Wildlife	Irrigation	Total 1/	Channel Improvement	Estimated Installation Cost: Land Treatment	Structural Measures	Floodplain Area
	(Sq.Mi.)	(No.)	(Sq.Mi.)	(Ac.Ft.)	(Ac.Ft.)	(Ac.Ft.)	(Ac.Ft.)	(Ac.Ft.)	(Ac.Ft.)	(Ac.Ft.)	(Miles)	($1,000)	($1,000)	(Acres)
A	None													
B	71.53	10	3.93	25	511					536	0.3	631.8	302.2	2,340
C	None													
D	243.66	23	93.20	1,903	23,186	1,200		1,918		28,207	53.6	1,928.6	2,461.0	9,700
E	688.44	69	168.57	4,117	35,864	1,698	270		550	42,499	143.05	3,245.4	4,233.5	24,775
F	46.33	20	20.18	419	4,967	77		3,786		9,249	7.6	471.3	1,538.5	1,049
G	57.76	5	4.10	69	860			147		1,076	18.1	420.7	685.4	1,335
H	62.28	5	3.67	76	646					722	18.4	472.3	686.0	1,874
I	28.64										12.6	315.0	302.3	1,766
J	74.07	2	6.80	92	1,157					1,249	22.4	227.7	447.0	3,360
Total	1,272,71	134	300.45	6,701	67,191	2,975	270	5,851	550	83,538	276.05	7,712.8	10,655.9	46,199

1/ To crest of emergency spillway.

TABLE XXVI - B

Upstream Watersheds - Completed Projects 1/
Multiple-Purpose Structures

Watershed Name	State	Number of Structures	STORAGE VOLUME BY PURPOSE: Flood Prevention		M & I Water Supply		Recreation		Fish & Wildlife		Irrigation		Estimated Recreation Days Provided	Population Served by Water Supply
		(No.)	(Ac. Ft.)	(Acres)2/	(Ac. Ft.)	(Acres)	(Ac. Ft.)	(Acres)	(Ac. Ft.)	(Acres)	(Ac. Ft.)	(Acres)		
WATER SUB-REGION A														
None														
WATER SUB-REGION B														
None														
WATER SUB-REGION C														
None														
WATER SUB-REGION D														
Marbury Creek	Ga.	1	2,550	392	1,200	69			1,918	187				5,555
WATER SUB-REGION E														
Bristows Creek	Ala.	2	1,125	189							550	103		5,290
High Pine Creek	Ala.	1	813	85	500	49								
Hazel Creek	Ga.	1	439	48	150	23								2,936
Mill Creek	Ga.	2	1,357	152	1,048	136								17,868
Sautee Creek	Ga.	1	285	25			270	22					5,000	
Total		7	4,019	499	1,698	208	270	22			550	103	5,000	26,094
WATER SUB-REGION F														
Mill Run	Pa.	1	2,350	650					3,786	556				
Upper Grave Creek	W. Va.	1	92	8	77	5								1,700
Total		2	2,442	658	77	5			3,786	556				1,700

TABLE XXVI - B (continued)

Upstream Watersheds - Completed Projects - Multiple-Purpose Structures

Watershed Name	State	Number of Structures	STORAGE VOLUME BY PURPOSE: Flood Prevention		M & I Water Supply		Recreation		Fish & Wildlife		Irrigation		Estimated Recreation Days Provided	Population Served by Water Supply
		(No.)	(Ac. Ft.)	(Acres) 2/	(Ac. Ft.)	(Acres)	(Ac. Ft.)	(Acres)	(Ac. Ft.)	(Acres)	(Ac. Ft.)	(Acres)		
WATER SUB-REGION G														
Bonds Creek	W. Va.	1	86	16					147	12				
WATER SUB-REGION H														
None														
WATER SUB-REGION I														
None														
WATER SUB-REGION J														
None														
Grand Total		11	9,097	1,565	2,975	282	270	22	5,851	755	550	103	5,000	33,349

1/ As of June 30, 1967.

2/ Emergency spillway crest.

TABLE XXVI - B(1)

Summary - Upstream Watersheds - Completed Projects - Multiple-Purpose Structures

Water Sub Region	Number of Structures	STORAGE VOLUME AND SURFACE BY PURPOSE: Flood Prevention 1/		M&I Water Supply		Recreation		Fish & Wildlife		Irrigation		Estimated Recreation Days Provided	Population Served by Water Supply
	(No.)	(Ac.Ft.)	(Acres)	(Ac.Ft.)	(Acres)	(Ac.Ft.)	(Acres)	(Ac.Ft.)	(Acres)	(Ac.Ft.)	(Acres)	(Days)	(No.)
A	None												
B	None												
C	None												
D	1	2,550	392	1,200	69			1,918	187				5,555
E	7	4,019	499	1,698	208	270	22			550	103	5,000	26,094
F	2	2,442	658	77	5			3,786	556				1,700
G	1	86	16					147	12				
H	None												
I	None												
J	None												
Total	11	9,097	1,565	2,975	282	270	22	5,851	755	550	103	5,000	33,349

1/ To crest of emergency spillway.

TABLE XXVI - C

Upstream Watersheds - Completed Projects 1/
Average Annual Flood Damages (Dollars)

Watershed Name	State	Crop & Pasture	Other Agriculture	Residential & Commercial	Road & Bridge	Sediment & Erosion	Indirect	Total
WATER SUB-REGION A								
None								
WATER SUB-REGION B								
Dean Creek	New York	154	642		3,475	6,015		10,286
Great Brook	New York	500	452	9,616	1,440	5,475		17,483
Cory Creek	Pennsylvania	200	100	33,144	10,642	3,004	2,290	49,380
Warm Springs Run	West Virginia							
Total		854	1,194	42,760	15,557	14,494	2,290	77,149
WATER SUB-REGION C								
None								
WATER SUB-REGION D								
Barber Creek	Georgia	19,305	400		191	634		20,530
Marbury Creek	Georgia	10,648					70	10,718
Brushy Creek	South Carolina	22,382	72		275	1,350	2,273	26,352
Huff Creek	South Carolina	18,846	166		262	1,048	2,032	22,354
Twelve Mile Creek	South Carolina	9,904				197		10,101
Total		81,085	638		728	3,229	4,375	90,055
WATER SUB-REGION E								
Bristows Creek	Alabama	6,117			753			6,870
Little New River	Alabama	13,083	3,378			85		16,546
High Pine Creek	Alabama	50,818	5,000			8,456		64,274
Amicalola Creek	Georgia	17,542			1,446	177	341	19,506
Hazel Creek	Georgia	4,059			1,445	4,769	779	11,052
Hightower Creek	Georgia	13,162			820	2,787	675	17,444
Jacks River	Georgia	----------	----------	----------	No Treatment Needed	----------	----------	----------

TABLE XXVI - C (continued)

Upstream Watersheds - Completed Projects - Average Annual Flood Damages
(Dollars)

Watershed Name	State	Crop & Pasture	Other Agriculture	Residential & Commercial	Road & Bridge	Sediment & Erosion	Indirect	Total
WATER SUB-REGION E (continued)								
Mill Creek	Georgia	34,495	6,118		505	871	1,308	43,297
North Fork Broad River	Georgia	8,507			5,365	3,313		17,185
Sautee Creek	Georgia	12,234	5,201		1,939	1,996		21,370
Setting Down Creek	Georgia	1,086			5,000	10,800		16,886
Shammack Cr.	Mississippi	28,452	1,368		700	136	1,557	32,213
Total		189,555	21,065		17,973	33,390	4,660	266,643
WATER SUB-REGION F								
Mill Run	Pennsylvania			18,414	224		3,728	22,366
N. Fr. Cowanesque River	Pennsylvania	6,680		2,010	10,930	1,070	4,040	24,730
Saul-Mathay Run	Pennsylvania			11,480	295		1,766	13,541
Salem Fork-Ten Mile Creek	West Virginia	1,209		26,829	477	2,190	2,100	32,805
Upper Grave Creek	West Virginia			51,000	15,000	12,118	15,624	98,742
Total		7,889		109,733	26,926	15,378	27,258	187,184
WATER SUB-REGION G								
Back Creek	Virginia	1,511						1,511
Bonds Creek	West Virginia	5,156	4,135	4,001	1,480	2,161	1,442	18,375
Dave's Fork-Christian's Fork	West Virginia			36,130		595	5,419	42,144
Marlin Run	West Virginia			15,727			2,359	18,086
Total		6,667	4,135	55,858	1,480	2,756	9,220	80,116
WATER SUB-REGION H								
Red River (Stillwater Creek)	Kentucky	1,640						1,640
Upper Green River	Kentucky	22,755		16,705	967	1,283		41,710
Total		24,395		16,705	967	1,283		43,350
WATER SUB-REGION I								
Meadow Creek	Kentucky	5,750	1,105				686	7,541
Proctor Creek	Tennessee	1,652	150		3,500	484	902	6,688
Total		7,402	1,255		3,500	484	1,588	14,229

TABLE XXVI - C (continued)

Upstream Watersheds - Completed Projects - Average Annual Flood Damages
(Dollars)

Watershed Name	State	Crop & Pasture	Other Agriculture	Residential & Commercial	Road & Bridge	Sediment & Erosion	Indirect	Total
WATER SUB-REGION J								
Clear Creek	Alabama	No data available						
Little Paint Creek	Alabama	25, 263	11, 605	22	594	1, 638		39, 122
Total		25, 263	11, 605	22	594	1, 638		39, 122
Grand Total		343, 110	39, 892	225, 078	67, 725	72, 652	49, 391	797, 848

1/ As of June 30, 1967.

TABLE XXVI-C(1)

Summary - Upstream Watersheds - Completed Projects - Average Annual Flood Damages (Dollars)

Sub-Region	Crop and Pasture	Other Agriculture	Residential and Commercial	Road and Bridge	Sediment and Erosion	Indirect	Total
A	None						
B	854	1,194	42,760	15,557	14,494	2,290	77,149
C	None						
D	81,085	638		728	3,229	4,375	90,055
E	189,555	21,065		17,973	33,390	4,660	266,643
F	7,889		109,733	26,926	15,378	27,258	187,184
G	6,667	4,135	55,858	1,480	2,756	9,220	80,116
H	24,395		16,705	967	1,283		43,350
I	7,402	1,255		3,500	484	1,588	14,229
J	25,263	11,605	22	594	1,638		39,122
Total	343,110	39,892	225,078	67,725	72,652	49,391	797,848

TABLE XXVI - D

Upstream Watersheds - Completed Projects 1/
Average Annual Benefits (Dollars)

Watershed Name	State	Damage Reduction	More Intensive Land Use	Changed Land Use	Drainage	Irrigation	M & I Water Supply	Recreation	Total
WATER SUB-REGION A									
None									
WATER SUB-REGION B									
Dean Creek	New York	16,540							16,540
Great Brook	New York	4,104	90						4,194
Cory Creek	Pennsylvania	6,129							6,129
Warm Springs Run	West Virginia	24,945	100						25,045
Total		51,718	190						51,908
WATER SUB-REGION C									
None									
WATER SUB-REGION D									
Barber Creek	Georgia	21,946 (2)							21,946
Marbury Creek	Georgia	10,430	9,631				6,240		26,301
Brushy Creek	South Carolina	38,192 (2)							38,192
Huff Creek	South Carolina	22,922 (2)							22,922
Twelve Mile Creek	South Carolina	16,591 (2)	28,544						45,135
Total		110,081 (2)	38,175				6,240		154,496
WATER SUB-REGION E									
Bristows Creek	Alabama	7,698 (2)				6,773			14,471
Little New River	Alabama	11,954							11,954
High Pine Creek	Alabama	42,811					1,760		44,571
Amicalola Creek	Georgia	22,691 (2)							22,691
Hazel Creek	Georgia	7,355	10,181				426		17,962
Hightower Creek	Georgia	14,482							14,482
Jacks River	Georgia	---------- No Treatment Needed ----------							
Mill Creek	Georgia	34,341					3,966		38,307
North Fork Broad River	Georgia	11,482	78,050						89,532
Sautee Creek	Georgia	16,520						3,375	19,895
Settingdown Creek	Georgia	13,285	57,595						70,880
Shammack Creek	Mississippi	29,510		7,950					37,460
Total		212,129	145,826	7,950		6,773	6,152	3,375	382,205

TABLE XXVI - D (continued)

Upstream Watersheds - Completed Projects - Average Annual Benefits (Dollars)

Watershed Name	State	Damage Reduction	More Intensive Land Use	Changed Land Use	Drainage	Irrigation	M & I Water Supply	Recreation	Total
WATER SUB-REGION F									
Mill Run	Pennsylvania	21,295							21,295
N. Fr. Cowanesque River	Pennsylvania	9,140							9,140
Saul Mathay Run	Pennsylvania	12,601							12,601
Salem Fork-Ten Mile Creek	West Virginia	17,143	1,272						18,415
Upper Grave Creek	West Virginia	52,069							52,069
Total		112,248	1,272						113,520
WATER SUB-REGION G									
Back Creek	Virginia	1,303			1,303				2,606
Bonds Creek	West Virginia	15,280							15,280
Dave's Fork-Christian's Fork	West Virginia	34,096							34,096
Marlin Run	West Virginia	16,582							16,582
Total		67,261			1,303				68,564
WATER SUB-REGION H									
Red River (Stillwater Creek)	Kentucky	13,820 (2)							13,820
Upper Green River	Kentucky	12,995	3,849						16,844
Total		26,815	3,849						30,664
WATER SUB-REGION I									
Meadow Creek	Kentucky	5,853		8,470					14,323
Proctor Creek	Tennessee	2,865	977						3,842
Total		8,718	977	8,470					18,165
WATER SUB-REGION J									
Clear Creek	Alabama	No Data Available							
Little Paint Creek	Alabama	28,446							28,446
Total		28,446							28,446
Grand Total		617,416	190,289	16,420	1,303	6,773	12,392	3,375	847,968

1/ As of June 30, 1967.

(2) **Includes other than flood damage reduction benefits. Data were not available for complete breakdown.**

TABLE XXVI-D (1)

Summary - Upstream Watersheds - Completed Projects - Average Annual Benefits (Dollars)

Sub-Region	Damage Reduction	More Intensive Land Use	Changed Land Use	Drainage	Irrigation	M & I Water Supply	Recreation	Total
A	None							
B	51,718	190						51,908
C	None							
D	110,081	38,175				6,240		154,496
E	212,129	145,826	7,950		6,773	6,152	3,375	382,205
F	112,248	1,272						113,520
G	67,261			1,303				68,564
H	26,815	3,849						30,664
I	8,718	977.	8,470					18,165
J	28,446							28,446
Total	617,416	190,289	16,420	1,303	6,773	12,392	3,375	847,968

TABLE XXVII - A

Upstream Watersheds - Authorized for Installation Projects 1/ - Structural Measures

Watershed Name	State	Project Area	No. of Structures	Drainage Area Controlled	STORAGE VOLUME BY PURPOSE: Sediment	Floodwater	M & I Water Supply	Recreation	Fish & Wildlife	Irrigation	Total 2/	Channel Improvement	ESTIMATED INSTALLATION COST: Land Treatment	Structural Measures	Floodplain Area
		(Sq. Mi.)	(No.)	(Sq. Mi.)	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	(Miles)	($1,000)	($1,000)	(Acres)
WATER SUB-REGION A															
Brodhead Creek	Pa.	29.10	4	18.75	308	4,107		60			4,475		49.4	1,525.6	100
Green-Dreher Tribs.	Pa.	74.70	16	30.71	311	6,946					7,257		115.6	2,605.0	445
Lackawazen Tribs.	Pa.	41.60	7	5.43	81	1,112					1,193		163.6	339.9	325
Little Schuylkill R.	Pa.	135.70	4	35.13	592	8,694			1,742		11,028	0.13	325.1	2,092.6	1,000
Mauch Chunk Creek	Pa.	9.05	1	5.95	61	1,094	375	3,794			5,324		116.1	1,101.8	30
Total		290.15	32	95.97	1,353	21,953	375	3,854	1,742		29,277	0.13	769.8	7,664.9	1,900
WATER SUB-REGION B															
Little Youghiogheny R.	Md.	41.05	6	14.39	216	2,458	253	1,072			3,999	1.6	473.0	1,465.5	1,000
Genegantslet Creek	N. Y.	103.84	2	6.7		480		390	889		1,759	5.0	144.9	167.8	1,105
L. Choconut, Finch Hollow, Trout Brook	N. Y.	19.18	7	16.22	473	2,397					2,870		152.2	1,502.7	303
Nanticoke Creek	N. Y.	114.06	11	40.04	794	5,904			664		7,362	5.6	222.0	2,570.8	1,100
Patterson, Brixius, Grey Creek	N. Y.	12.50	1	4.42	56	904					960		33.3	430.3	
Upper Five Mile Cr.	N. Y.	59.53										0.1	345.6	287.9	565
Briar Creek	Pa.	14.60	3	7.72	199	1,073		603			1,875		35.4	610.5	150
Marsh Creek	Pa.	82.72	5	13.18	203	2,085	313	1,392			3,993		111.9	1,370.5	750
Martin Creek	Pa.	49.50	2	1.09	8	181					189		113.4	231.6	1,500
Middle Creek	Pa.	131.40	3	56.04	770	8,895	56	2,445			12,166		371.8	2,703.5	547
Mill Creek	Pa.	13.17	3	4.5	46	756	15		1,120		1,937	1.2	227.5	583.3	120
Lunice Creek	W. Va.	89.51	5	47.41	1,339	7,390					8,729	0.61	148.4	1,935.8	1,159
New Creek-Whites Run	W. Va.	56.58	12	14.71	664	2,806	960				4,430		88.3	1,569.0	
Patterson Creek	W. Va.	283.20	35	139.64	1,997	25,807	184				27,988	0.85	759.6	5,038.2	7,172
South Fork	W. Va.	288.83	24	118.65	2,282	28.186					30,468		217.9	4,609.8	9,200
Total		1,359.67	119	484.71	9,047	89.322	1,781	5,902	2,673		108,725	15.0	3,445.2	25,077.2	24,671
WATER SUB-REGION C															
Johns Creek	Va.	101.56	4	31.15	642	4,646					5,288	17.8	105.5	551.9	1,346

TABLE XXVII - A (continued)

Upstream Watersheds - Authorized for Installation Projects 1/ - Structural Measures

Watershed Name	State	Project Area	No. of Structures	Drainage Area Controlled	STORAGE VOLUME BY PURPOSE: Sediment	Flood-Water	M & I Water Supply	Recreation	Fish & Wildlife	Irrigation	Total 2/	Channel Improvement	ESTIMATED INSTALLATION COST: Land Treatment	Structural Measures	Flood-plain Area
		(Sq. Mi.)	(No.)	(Sq. Mi.)	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	(Miles)	($1,000)	($1,000)	(Acres)
WATER SUB-REGION D															
Little Sandy & Trail Creek	Ga.	42.62	6	37.24	1,879	7,789		2,175			11,843	13.86	291.0	1,741.4	1,670
Middle Oconee-Walnut Creek	Ga.	143.28	20	86.3	2,479	22,352	450				25,281	46.0	1,288.2	2,903.8	7,530
Sandy Creek	Ga.	32.81	6	16.3	428	3,341					3,769	15.3	273.2	376.9	1,585
South Fork of Broad River	Ga.	145.30	9	62.7	2,073	14,193	206			135	16,607	29.9	1,700.9	1,459.6	5,802
South River	Ga.	93.55	8	55.84	1,320	12,950					14,270	19.25	836.0	826.7	4,800
Abbotts Creek 3/	N. C.	180.16	14	29.93	759	4,740					5,499	49.7	1,259.5	625.3	7,409
Deep Creek	N. C.	117.66	17	47.11	713	8,809					9,522	39.7	566.5	682.2	5,965
Dutchman Creek	N. C.	127.34	9	54.90	1,551	9,721		247			11,519	38.7	585.8	1,681.1	4,280
Little Yadkin River	N. C.	61.71	3	13.69	1,867	2,408					4,275	31.0	628.8	500.3	1,047
Muddy Creek	N. C.	100.00	9	36.0	647	5,039					5,686	23.4	586.8	403.7	3,479
Stewarts-Lovills Cr.	N. C.	112.50	4	60.08	1,702	12,505	964				15,171	11.0	474.9	719.3	2,807
Town Fork Creek	N. C.	132.06	13	81.04	4,515	17,936					22,451	21.2	994.6	973.8	5,394
Big Creek	S. C.	20.75	2	7.41	396	1,468	731				2,595	4.36	177.9	308.3	888
Broad Mouth Creek	S. C.	29.06	4	8.12	207	1,674					1,881	11.22	232.3	319.0	1,129
Coneross Creek	S. C.	67.66	5	26.11	1,189	6,175					7,364	14.34	429.4	675.7	3,087
Georges Creek	S. C.	31.79	5	17.57	548	4,198	900				5,646	6.25	238.6	530.0	1,433
South Tyger River	S. C.	59.60	6	33.86	1,285	6,823	108				8,216	15.02	354.1	853.3	3,120
Thicketty Creek	S. C.	116.63	9	52.88	1,663	9,398			780		11,841	11.21	588.5	1,059.2	6,684
Three and Twenty Cr.	S. C.	74.36	7	40.16	2,829	7,722					10,551	20.00	500.4	1,012.7	2,034
Wilson Creek	S. C.	36.44	3	12.51	760	2,682					3,442	5.24	259.4	331.2	1,826
Total		1,725.28	159	779.75	28,810	161,923	3,359	2,422	780	135	197,429	426.65	12,266.8	17,983.5	71,969
WATER SUB-REGION E															
Blue Eye Creek	Ala.	22.08	2	7.97	168	2,017					2,185	9.21	226.1	417.6	1,402
Cheaha Creek	Ala.	121.88	5	50.31	462	10,085					10,547	17.42	366.4	1,584.3	3,510
Choccolocco Creek	Ala.	375.94	15	116.95	2,183	34,005	9,792	326			46,306	52.5	3,048.0	6,607.2	16,129
Crooked Creek	Ala.	99.31	6	29.96	629	6,435	2,000				9,064	13.56	536.5	1,116.7	3,896
Ketchepedrake Creek	Ala.	54.86	5	29.10	233	7,139					7,372	13.4	299.2	1,029.5	2,367
Lost Creek	Ala.	26.78	4	13.62	444	2,828					3,272		155.2	274.3	713
Mill Creek	Ala.	10.61	1	7.31	631	3,497					4,128	2.2	32.6	1,652.0	679
Terrapin Creek	Ala.	286.99	10	121.60	1,663	22,198					23,861	17.4	978.7	1,284.3	13,786
Allatoona Creek	Ga.	101.59											248.0	26.3	750
Big Cedar Creek	Ga.	208.13	11	42.00	1,884	12,232		933			15,049	28.6	1,104.2	2,187.2	12,440
Cartecay River	Ga.	140.23	7	50.07	812	7,844					8,656		382.4	578.1	2,184

TABLE XXVII - A (continued)
Upstream Watersheds - Authorized for Installation Projects 1/ - Structural Measures

Watershed Name	State	Project Area	No. of Structures	Drainage Area Controlled	Sediment	Floodwater	M & I Water Supply	Recreation	Fish & Wildlife	Irrigation	Total 2/	Channel Improvement	Land Treatment	Structural Measures	Floodplain Area
					STORAGE VOLUME BY PURPOSE								ESTIMATED INSTALLATION COST		
		(Sq. Mi.)	(No.)	(Sq. Mi.)	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	(Miles)	($1,000)	($1,000)	(Acres)
WATER SUB-REGION E (continued)															
Ellijay River	Ga.	95.47	8	44.87	772	7,804					8,576		191.3	1,033.5	1,200
Euharlee Creek	Ga.	170.19	12	51.19	1,923	13,235		566			15,724	29.9	1,739.7	2,113.1	8,000
Etowah River Reach	Ga.	201.03	18	87.32	2,701	19,771					22,472	18.9	445.6	1,327.1	6,600
Grove River	Ga.	86.88	11	57.70	2,626	14,061	948				17,635	35.38	814.8	2,116.0	5,729
Haynes Creek - Brushy Fork	Ga.	31.25	4	6.70	221	1,462					1,683	14.0	619.6	381.5	1,335
Head of Little Tennessee River	Ga.	57.33	2	21.53	161	2,660					2,821	13.0	179.5	278.1	1,537
Hiawassee River	Ga.	58.88	2	29.72	928	4,948		141			6,017		177.4	1,301.4	1,000
Little River	Ga.	105.38	14	37.04	1,030	6,846					7,876	37.2	800.0	731.7	4,350
Little River	Ga.	44.50	6	24.32	1,329	7,116	120				8,565	18.64	259.4	974.3	2,042
Little Tallapoosa R.	Ga.	97.68	14	62.25	1,591	14,805	2,471				18,867	35.3	990.7	1,715.3	6,107
Long Swamp Creek	Ga.	89.02	6	43.57	750	9,242					9,992		210.3	1,179.3	1,700
Lower Little Tallapoosa River	Ga.	208.55	27	128.30	6,330	36,183	3,673	303			46,489	63.0	1,730.3	4,115.4	12,435
Middle Fork Broad R.	Ga.	79.42	10	42.69	1,305	7,388					8,693	25.0	316.8	904.1	2,610
Mill-Canton Creek	Ga.	130.29	8	22.44	722	4,741					5,463	0.95	724.4	582.3	1,759
Mountaintown Creek	Ga.	87.90	4	25.33	438	4,877					5,315		126.3	369.1	1,800
Noonday Creek	Ga.	50.40	13	22.28	789	5,002					5,791	23.7	258.2	544.1	2,500
North Broad River	Ga.	72.61	8	19.60	663	4,209					4,872	23.7	458.9	603.8	3,035
Pine Log Tributary	Ga.	131.09	16	81.32	2,529	21,611		360			24,500	27.95	824.3	3,207.1	6,038
Pumpkinvine Creek	Ga.	162.18	18	73.87	2,012	17,799					19,811	30.0	431.4	908.1	6,800
Raccoon Creek	Ga.	61.67	5	44.60	980	10,212					11,192		254.4	456.0	1,440
Sallacoa Creek Area	Ga.	119.69	18	67.37	2,315	17,116	309	425			20,165	25.6	628.7	4,009.6	6,385
Sharp Mountain Creek	Ga.	92.86	14	38.90	1,118	8,845					9,963	49.0	288.9	646.5	4,300
Stamp-Shoal Creek	Ga.	152.97	2	14.76	376	3,078					3,454		399.4	175.0	773
Talking Rock Creek	Ga.	188.90	6	25.72	629	6,606					7,235	11.46	460.3	663.3	2,600
Chiwapa Creek	Miss.	158.33	10	33.07	877	9,517		469			10,863	49.98	1,860.8	1,931.2	36,756
ChuquatoncheeCreek	Miss.	213.80	22	86.35	3,397	26,485			1,326		31,208	59.33	1,056.5	2,699.8	24,345
Gray's Creek	Miss.	36.90	10	13.31	455	4,045					4,500	17.86	437.0	1,077.3	8,784
Houlka Creek	Miss.	229.00	16	62.28	2,425	20,131		1,975			24,531	64.61	2,031.1	3,449.5	26,935
Muddy Creek	Miss.	126.24	28	49.11	2,688	13,888					16,576	38.10	851.7	2,208.6	33,044
Tallahaga Creek	Miss.	124.00	11	43.76	3,337	14,391					17,728	51.45	803.7	2,392.2	18,951
Town Creek	Miss.	385.90	35	158.56	5,602	52,555		15,394			73,551	180.00	2,061.2	6,770.3	55,160
Tuscumbia Creek	Miss.	348.70	22	98.41	11,391	29,310					40,701	130.53	2,821.3	4,865.5	35,465
W. Hatchie Creek	Miss.	74.80	8	25.38	989	6,144					7,133	39.60	475.9	1,148.0	4,558
L. Tippah River	Miss.	164.39	12	95.54	19,938	23,633		828			44,399	55.99	581.4	3,601.7	8,664
Mill Creek	Miss.	31.78	4	4.51	326	878					1,204	15.71	277.2	359.6	2,205

TABLE XXVII - A (continued)

Upstream Watersheds - Authorized for Installation Projects 1/ - Structural Measures

Watershed Name	State	Project Area	No. of Structures	Drainage Area Controlled	Sediment	Floodwater	M & I Water Supply	Recreation	Fish & Wildlife	Irrigation	Total 2/	Channel Improvement	Estimated Installation Cost: Land Treatment	Estimated Installation Cost: Structural Measures	Floodplain Area
		(Sq. Mi.)	(No.)	(Sq. Mi.)	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	(Miles)	($1,000)	($1,000)	(Acres)
WATER SUB-REGION E (continued)															
N. Tippah Creek	Miss.	26.56	4	3.93	172	806					978	8.00	41.0	257.8	2,255
Oaklimeter Creek	Miss.	98.80	12	11.63	351	2,929					3,280	21.00	367.9	1,153.5	5,358
U. Tippah River	Miss.	98.60	1	2,01	44	507					551	1.52	583.3	400.3	
Locks Creek	Miss.	32.80	4	9.88	399	2,367					2,766	14.79	180.2	465.1	2,890
Little Spring - Ochewalla Creek	Miss.	50.44										27.75	288.6	871.4	2,015
Hell Creek	Miss.	40.36	5	5.68	386	1,279					1,665	19.00	247.2	521.1	5,129
Duncan-Cane Creek	Miss.	30.81	6	7.89	265	2,033					2,298	15.61	238.9	339.0	4,323
Cypress, etc. Creek	Miss.	87.79	11	35.20	876	8,088					8,964	19.70	393.7	738.4	5,506
Cane Creek	Miss.	26.56	6	5.27	250	1,367					1,617	1.74	86.1	218.4	
Pigeon Roost Creek	Miss.	236.20	3	2.88	180	572					752	28.52	2,339.0	1,110.0	14,173
Coldwater River	Miss.	227.38	13	63.49	4,029	17,016					21,045	58.46	2,453.9	3,952.7	7,084
Fair Creek	Miss.	5.84	2	1.94	231	588					819	2.40	64.1	86.9	
U. Skuna River	Miss.	156.84										32.16	828.4	510.9	14,119
Total		7,037.36	557	2,362.36	101,955	596,426	19,313	21,720	1,326		740,740	1,590.78	42,078.0	88,222.4	467,650
WATER SUB-REGION F															
Conewango Creek	N.Y.	297.00	20	103.20	1,725	14,912		5,974	967		23,578	17.0	1,258.1	5,321.9	11,000
Ischua Creek	N.Y.	117.03	8	43.84	352	7,557		972	600		9,481		479.3	1,818.2	1,560
Dunlap Creek	Pa.	16.55	4	8.56	151	1,227			780		2,158	0.24	100.3	1,038.2	600
Harmon Creek	Pa.	38.05	14	19.70	532	3,127	300		681		4,640		717.6	2,003.3	
Little Shenango R.	Pa.	113.65	7	60.84	252	7,246		2,505			10,003		901.9	1,772.0	540
Oil Creek	Pa.	174.40	6	72.24	491	10,499					10,990		811.3	2,352.4	615
Sandy Creek	Pa.	65.63	2	58.80	133	5,349			19,875		25,357		365.2	1,259.2	100
Polk Creek	W. Va.	11.38	8	6.58	253	1,528					1,781		56.2	485.7	
U. Deckers Creek	W. Va.	31.16	5	14.55	389	1,651					2,040	7.2	179.9	807.1	1,129
U. Buffalo Creek	W. Va.	71.74	12	37.51	1,429	5,906		208			7,543	1.92	332.0	3,232.8	705
Wheeling Creek	W. Va.	298.72	7	201.00	3,590	31,421		859			35,870		1,863.4	6,063.2	1,245
Total		1,235.31	93	626.82	9,297	90,423	300	10,518	22,903		133,441	26.36	7,065.2	26,174.0	17,494
WATER SUB-REGION G															
Buffalo Creek	Ohio	50.23	3	18.74	1,438	2,057	267				3,762	8.7	336.0	971.1	2,034
Margaret Creek	Ohio	60.31	6	19.35	868	2,152	380	1,903			5,303	9.8	249.4	998.6	1,474
Rush Creek	Ohio	236.66	23	96.36	6,238	9,716	1,416	836			18,206	22.1	765.9	4,945.3	10,861
W. Fr. Duck Creek	Ohio	106.84	8	39.97	2,618	8,838	587	4,350			16,393	19.9	425.4	3,357.3	3,230
S. Fr. Roanoke R.	Va.	138.25	4	84.91	2,463	12,635					15,098	6.97	487.5	1,963.8	1,429

TABLE XXVII - A (continued)

Upstream Watersheds - Authorized for Installation Projects 1/ - Structural Measures

Watershed Name	State	Project Area	No. of Structures	Drainage Area Controlled	STORAGE VOLUME BY PURPOSE: Sediment	Floodwater	M & I Water Supply	Recreation	Fish & Wildlife	Irrigation	Total 2/	Channel Improvement	ESTIMATED INSTALLATION COST: Land Treatment	Structural Measures	Floodplain Area
		(Sq. Mi.)	(No.)	(Sq. Mi.)	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	(Miles)	($1,000)	($1,000)	(Acres)
WATER SUB-REGION G (continued)															
Big Ditch Run	W. Va.	8.95	1	1.17	47	176		372			595	3.75	51.7	642.0	
Blake & Armours at Nitro	W. Va.	5.66	1	2.44	128	542		81			751		9.8	430.2	160
Brush Creek	W. Va.	34.83	11	14.96	247	2,635	1,776	186			4,844	5.86	85.6	2,416.0	1,150
Pecks Run	W. Va.	12.83										6.0	89.7	266.2	304
Saltlick Creek	W. Va.	49.50	5	19.77	305	3,954					4,259		180.2	735.3	835
Shooks Run	W. Va.	3.01										0.71	11.4	43.1	80
Total		707.07	62	297.67	14,352	42,705	4,426	7,728			69,211	83.79	2,692.6	16,768.9	21,557
WATER SUB-REGION H															
Buck Creek	Ky.	57.31	3	15.00	405	2,772					3,177	10.0	1,074.4	556.8	3,104
Fox Creek	Ky.	78.75	5	25.30	1,557	3,915		246			5,718	7.3	480.7	1,059.8	2,284
Total		136.06	8	40.30	1,962	6,687		246			8,895	17.3	1,555.1	1,616.6	5,388
WATER SUB-REGION I															
Mill Creek	Ky.	33.09	1	7.26	568	1,612	735	445			3,360		380.3	496.0	460
Jennings Creek	Tenn.	72.11	13	29.30	930	5,442					6,372	19.3	217.9	1,931.9	1,835
Line Creek	Tenn.	63.02	5	30.76	678	8,217					8,895	29.6	308.1	1,521.9	2,124
Mill Creek	Tenn.	38.41	1	17.87	204	2,496					2,700	12.67	112.6	579.4	1,003
Total		206.63	20	85.19	2,380	17,767	735	445			21,327	61.57	1,018.9	4,529.2	5,422
WATER SUB-REGION J															
Big Coon Creek	Ala.	51.93										8.3	161.7	504.1	1,457
Big Nance Creek	Ala.	185.82	10	46.11	837	11,678	1,100				13,615	60.3	258.4	2,300.7	9,601
Crowdabout Creek 3/	Ala.	49.54	8	15.72	235	4,836					5,071	28.6	250.3	838.2	4,519
Hurricane Creek	Ala.	71.20	7	40.31	537	10,330					10,867	14.4	121.1	1,665.6	3,899
Town Creek	Ala.	251.56	15	72.71	1,214	22,466				608	24,288	71.0	524.7	2,694.7	13,794
Mud Creek 3/	N. C.	112.27	17	57.42	1,316	10,465					11,781	27.8	947.5	891.2	6,290

TABLE XXVII - A (continued)

Upstream Watersheds - Authorized for Installation Projects 1/ - Structural Measures

Watershed Name	State	Project Area	No. of Structures	Drainage Area Controlled	STORAGE VOLUME BY PURPOSE: Sediment	Floodwater	M & I Water Supply	Recreation	Fish & Wildlife	Irrigation	Total 2/	Channel Improvement	ESTIMATED INSTALLATION COST: Land Treatment	Structural Measures	Floodplain Area
		(Sq. Mi.)	(No.)	(Sq. Mi.)	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	(Miles)	($1,000)	($1,000)	(Acres)
WATER SUB-REGION J (continued)															
Crow Creek	Tenn.	158.59										52.6	293.9	979.7	7,472
Lick Creek 3/	Tenn.	263.11	41	125.49	4,536	22,522					27,058	100.5	1,419.0	4,754.1	15,225
Pine Creek	Tenn.	26.25	4	6.11	77	1,461	485	164			2,187	6.7	124.1	932.6	520
Roarks Cove (Mud Cr.)	Tenn.	20.00										23.9	95.0	270.4	2,655
Shady Valley (Beaver Dam Cr.)	Tenn.	18.79										10.3	90.3	335.0	1,176
Total		1,209.06	102	363.87	8,752	83,758	1,585	164		608	94,867	404.4	4,286.0	16,166.3	66,608
Grand Total		14,008.15	1,156	5,167.79	178,550	1,115,610	31,874	52,999	29,424	743	1,409,200	2,643.74	75,283.1	204,754.9	684,005

1/ As of June 30, 1967.
2/ Emergency spillway crest.
3/ Inactive.

TABLE XXVII-A (1)

Summary - Upstream Watersheds - Authorized for Installation - Structural Measures

Sub-Region	Project Area	Number of Structures	Drainage Area Controlled	STORAGE VOLUME BY PURPOSE: Sediment	Floodwater	M & I Water Supply	Recreation	Fish and Wildlife	Irrigation	Total 1/	Channel Improvement	Estimated Installation Cost: Land Treatment	Structural Measures	Floodplain Area
	(Sq.Mi.)	(No.)	(Sq.Mi.)	(Ac.Ft.)	(Ac.Ft.)	(Ac.Ft.)	(Ac.Ft.)	(Ac.Ft.)	(Ac.Ft.)	(Ac.Ft.)	(Miles)	($1,000)	($1,000)	(Acres)
A	290.15	32	95.97	1,353	21,953	375	3,854	1,742		29,277	0.13	769.8	7,664.9	1,900
B	1,359.67	119	484.71	9,047	89,322	1,781	5,902	2,673		108,725	15.00	3,445.2	25,077.2	24,671
C	101.56	4	31.15	642	4,646					5,288	17.80	105.5	551.9	1,346
D	1,725.28	159	779.75	28,810	161,923	3,359	2,422	780	135	197,429	426.65	12,266.8	17,983.5	71,969
E	7,037.36	557	2,362.36	101,955	596,426	19,313	21,720	1,326		740,740	1,590.78	42,078.0	88,222.4	467,650
F	1,235.31	93	626.82	9,297	90,423	300	10,518	22,903		133,441	26.36	7,065.2	26,174.0	17,494
G	707.07	62	297.67	14,352	42,705	4,426	7,728			69,211	83.79	2,692.6	16,768.9	21,557
H	136.06	8	40.30	1,962	6,687		246			8,895	17.30	1,555.1	1,616.6	5,388
I	206.63	20	85.19	2,380	17,767	735	445			21,327	61.57	1,018.9	4,529.2	5,422
J	1,209.06	102	363.87	8,752	83,758	1,585	164		608	94,867	404.40	4,286.0	16,166.3	66,608
Total	14,008.15	1,156	5,167.79	178,550	1,115,610	31,874	52,999	29,424	743	1,409,200	2,643.74	75,283.1	204,754.9	684,005

1/ To Crest of emergency spillway.

TABLE XXVII- B

Upstream Watersheds - Authorized for Installation Projects 1/
Multiple-Purpose Structures

Watershed Name	State	Number of Structures	STORAGE VOLUME BY PURPOSE: Flood Prevention		M & I Water Supply		Recreation		Fish & Wildlife		Irrigation		Estimated Recreation Days Provided	Population Served by Water Supply
		(No.)	(Ac. Ft.)	(Acres)2/	(Ac. Ft.)	(Acres)	(Ac. Ft.)	(Acres)	(Ac. Ft.)	(Acres)	(Ac. Ft.)	(Acres)		
WATER SUB-REGION A														
Brodhead Creek	Pa.	1	1,050	36			60	11						
Little Schuylkill River	Pa.	1	3,040	200					1,742	96				
Mauch Chunk Creek	Pa.	1	1,094	384	375	350	3,794	330					120,000	2,700
Total		3	5,184	620	375	350	3,854	341	1,742	96			120,000	2,700
WATER SUB-REGION B														
Little Youghiogheny River	Md.	1	927	195	253	138	1,072	120					65,900	6,000
Genegantslet Creek	N. Y.	2	480	125			390	101	889	140			10,000	
Nanticoke Creek	N. Y.	2	678	32					684	51				
Briar Creek	Pa.	2	781	84			603	138					22,220	
Marsh Creek	Pa.	4	1,615	139	313	30	1,392	126					34,390	1,300
Middle Creek	Pa.	2	3,895	436	56	12	2,445	230					120,000	3,000
Mill Creek	Pa.	2	664	104	15	3			1,120	71				
New Creek-White Run	W. Va.	1	1,001	63	960	48								6,200
Patterson Creek	W. Va.	1	345	26	184	14								500
Total		17	10,386	1,204	1,781	245	5,902	715	2,673	262			252,510	17,000
WATER SUB-REGION C														
None														
WATER SUB-REGION D														
Little Sandy & Trail Cr.	Ga.	1	4,763	486			2,175	257					143,000	
Middle Oconee-Walnut Creek	Ga.	1	3,462	300	450	102								450
South Fork of Broad R.	Ga.	2	1,746	253	206	68					135	45		376
Dutchman Creek	N. C.	1	1,100	159			247	90					3,600	
Stewarts-Lovius Creek	N. C.	1	2,783	142	964	82								24,000
Big Creek	S. C.	2	1,468	231	731	128								3,720
Georges Creek	S. C.	1	1,200	152	900	94								
South Tyger River	S. C.	1	2,592	250	108	65								
Thicketty Creek	S. C.	1	1,278	168					780	100				
Total		11	20,392	2,141	3,359	539	2,422	347	780	100	135	45	146,600	28,546

TABLE XXVII - B (continued)

Upstream Watersheds - Authorized for Installation Projects - Multiple-Purpose Structures

Watershed Name	State	Number of Structures	STORAGE VOLUME BY PURPOSE: Flood Prevention		M & I Water Supply		Recreation		Fish & Wildlife		Irrigation		Estimated Recreation Days Provided	Population Served by Water Supply
		(No.)	(Ac. Ft.)	(Acres) 2/	(Ac. Ft.)	(Acres)	(Ac. Ft.)	(Acres)	(Ac. Ft.)	(Acres)	(Ac. Ft.)	(Acres)		
WATER SUB-REGION E														
Choccolocco Creek	Ala.	3	13,750	881	9,792	458	326	59					35,000	33,650
Crooked Creek	Ala.	2	1,674	206	2,000	136								3,220
Big Cedar Creek	Ga.	1	2,570	177			933	97					40,000	
Euharlee Creek	Ga.	1	3,957	238			566	92					43,000	
Grove River	Ga.	1	4,975	526	948	307								3,500
Hiawassee River	Ga.	1	605	26			141	12					20,000	
Little River	Ga.	1	1,058	100	120	42								750
Little Tallapoosa River	Ga.	3	4,362	592	2,471	436								14,800
Lower Little Tallapoosa	Ga.	7	12,898	1,526	3,673	621	303	121					6,100	18,300
Pine Log Tributary	Ga.	1	4,677	392			360	86					17,250	
Sallacoa Creek Area	Ga.	2	9,024	591	309	64	425	126					40,250	825
Chiwapa Creek	Miss.	1	434	93			469	64					12,760	
Chuquatonchee Creek	Miss.	1	1,671	355					1,326	227				
Houlka Creek	Miss.	2	4,098	638			1,975	351					23,000	
Town Creek	Miss.	7	10,729	2,277			15,394	1,625					83,335	
L. Tippah River	Miss.	1	4,950	664			828	259						
Total		35	81,432	9,282	19,313	2,064	21,720	2,892	1,326	227			320,695	75,045
WATER SUB-REGION F														
Conewango Creek	N. Y.	4	6,464	2,033			5,974	920	967	557			61,760	
Ischua Creek	N. Y.	3	2,467	168			972	80	600	255			28,000	
Dunlap Creek	Pa.	1	290	61					780	50				
Harmon Creek	Pa.	1	641	82	300	61			681	50				640
Little Shanango River	Pa.	3	2,560	790			2,505	1,033					18,820	
Sandy Creek	Pa.	1	5,000	1,960					19,875	1,740				
U. Buffalo Creek	W. Va.	1	373	47			208	30					15,800	
Wheeling Creek	W. Va.	1	11,180	440			859	125					93,000	
Total		15	28,975	5,581	300	61	10,518	2,188	22,903	2,652			216,840	640
WATER SUB-REGION G														
Buffalo Creek	Ohio	1	366	65	267	47							17,500	1,400
Margaret Creek	Ohio	2	969	233	380	137	1,903	166					33,000	1,180
Rush Creek	Ohio	5	1,924	372	1,416	254	836	56					21,728	7,000
W. Fr. Duck Creek	Ohio	1	1,202	240	587	209	4,350	195					60,500	2,606
Big Ditch Run	W. Va.	1	176	78			372	65					50,000	

TABLE XXVII- B (continued)

Upstream Watersheds - Authorized for Installation Projects - Multiple-Purpose Structures

Watershed Name	State	Number of Structures	STORAGE VOLUME BY PURPOSE: Flood Prevention		M& I Water Supply		Recreation		Fish & Wildlife		Irrigation		Estimated Recreation Days Provided	Population Served by Water Supply
		(No.)	(Ac. Ft.)	(Acres) 2/	(Ac. Ft.)	(Acres)	(Ac. Ft.)	(Acres)	(Ac. Ft.)	(Acres)	(Ac. Ft.)	(Acres)		
WATER SUB-REGION G (continued)														
Blakes & Armours at *Nitro*	W. Va.	1	542	46			81	28					21, 120	
Brush Creek	W. Va.	3	2, 001	267	1, 776	100	186	55					35, 140	25, 000
Total		14	7, 180	1, 301	4, 426	747	7, 728	565					238, 988	37, 186
WATER SUB-REGION H														
Fox Creek	Ky.	1	1, 225	215			246	51					16, 300	
WATER SUB-REGION I														
Mill Creek	Ky.	1	1, 612	180	735	109	445	72					18, 080	2, 500
WATER SUB-REGION J														
Big Nance Creek	Ala.	1			1, 100	82								1, 700
Town Creek	Ala.	1	1, 267	195							608	146		
Pine Creek	Tenn.	3	1, 230	228	485	49	164	51					48, 000	3, 500
Total		5	2, 497	423	1, 585	131	164	51			608	146	48, 000	5, 200
Grand Total		102	158, 883	20,947	31, 874	4, 246	52,999	7,222	29, 424	3, 337	743	191	1, 378, 013	168, 817

1/ As of June 30, 1967.

2/ Emergency spillway crest.

TABLE XXVII-B (1)

Summary - Upstream Watersheds - Authorized for Installation Projects - Multiple-Purpose Structures

Sub-Region	Number of Structures	STORAGE VOLUME AND SURFACE AREA BY PURPOSE										Estimated Recreation Days Provided	Population Served by Water Supply
		Flood Prevention 1/		M & I Water Supply		Recreation		Fish & Wildlife		Irrigation			
	(No.)	(Ac.Ft.)	(Acres)	(Ac.Ft.)	(Acres)	(Ac.Ft.)	(Acres)	(Ac.Ft.)	(Acres)	(Ac.Ft.)	(Acres)		
A	3	5,184	620	375	350	3,854	341	1,742	96			120,000	2,700
B	17	10,386	1,204	1,781	245	5,902	715	2,673	262			252,510	17,000
C	None												
D	11	20,392	2,141	3,359	539	2,422	347	780	100	135	45	146,600	28,546
E	35	81,432	9,282	19,313	2,064	21,720	2,892	1,326	227			320,695	75,045
F	15	28,975	5,581	300	61	10,518	2,188	22,903	2,652			216,840	640
G	14	7,180	1,301	4,426	747	7,728	565					238,988	37,186
H	1	1,225	215			246	51					16,300	
I	1	1,612	180	735	109	445	72					18,080	2,500
J	5	2,497	423	1,585	131	164	51			608	146	48,000	5,200
Total	102	158,883	20,947	31,874	4,246	52,999	7,222	29,424	3,337	743	191	1,378,013	168,817

1/ To crest of emergency spillway.

TABLE XXVII - C

Upstream Watersheds - Authorized for Installation Projects 1/
Average Annual Flood Damages (Dollars)

Watershed Name	State	Crop & Pasture	Other Agriculture	Residential & Commercial	Road & Bridge	Railroad	Sediment & Erosion	Indirect	Total
WATER SUB-REGION A									
Brodhead Creek	Pa.			33, 044	29, 659			8, 886	71, 589
Green-Dreher Tribs.	Pa.	10, 539	7, 516	92, 468	41, 837		6, 323	29, 320	188, 003
Lackawazen Tributaries	Pa.	275	3, 728	9, 179	11, 157		1, 888	3, 935	30, 162
Little Schuylkill River	Pa.			57, 132	4, 037	31, 969		13, 971	107, 109
Mauch Chunk Creek	Pa.			6, 147	650	575		1, 474	8, 846
Total		10, 814	11, 244	197, 970	87, 340	32, 544	8, 211	57, 586	405, 709
WATER SUB-REGION B									
Little Youghiogheny River	Md.	46, 000							46, 000
Genegantslet Creek	N. Y.			3, 230				646	3, 876
L. Choconut, Finch Hollow, Trout Brook	N. Y.	1, 514		25, 325	17, 121	4, 656	12, 960	10, 660	72, 236
Nanticoke Creek	N. Y.	450	670	11, 150	17, 650			6, 196	36, 116
Patterson Brixius Grey Cr.	N. Y.			12, 049	1, 333	903	5, 494	3, 956	23, 735
Upper Five Mile Creek	N. Y.	18, 914					3, 044	1, 891	23, 849
Briar Creek	Pa.		404	7, 872	128		2, 146	2, 110	12, 660
Marsh Creek	Pa.			52, 138	862	490	450	10, 743	64, 683
Martin Creek	Pa.			7, 257	5, 907			2, 633	15, 797
Middle Creek	Pa.	2, 376	539	68, 864	3, 101			13, 360	88, 240
Mill Creek	Pa.		569	34, 430	1, 554	705		7, 452	44, 710
Lunice Creek	W. Va.	1, 605	7, 662	28, 300	20, 912		19, 799	12, 299	90, 577
New Creek-Whites Run	W. Va.			159, 703			10, 573	20, 776	191, 052
Patterson Creek	W. Va.	39, 350	36, 768	53, 357	55, 907		74, 866	35, 396	295, 644
South Fork	W. Va.	27, 821	180, 877	132, 579	221, 008		58, 498	88, 731	709, 514
Total		138, 030	227, 489	596, 254	345, 483	6, 754	187, 830	216, 849	1, 718, 689
WATER SUB-REGION C									
Johns Creek	Va.	13, 502	1, 218		2, 968		4, 816	1, 435	23, 939
WATER SUB-REGION D									
Little Sandy & Trail Creek	Ga.	19, 425			104		836	94	20, 459
Middle Oconee-Walnut Creek	Ga.	66, 538			320		8, 636	6, 718	82, 212
Sandy Creek	Ga.	13, 604			2, 298		506	439	16, 847
South Fork of Broad River	Ga.	35, 041			540		3, 367	714	39, 662
South River	Ga.	26, 565			1, 328		6, 981	1, 517	36, 391

TABLE XXVII - C (continued)
Upstream Watersheds - Authorized for Installation Projects - Average Annual Flood Damages
(Dollars)

Watershed Name	State	Crop & Pasture	Other Agriculture	Residential & Commercial	Road & Bridge	Railroad	Sediment & Erosion	Indirect	Total
WATER SUB-REGION D (continued)									
Abbotts Creek 2/	N. C.	73,528	18,227		2,729		26,641		121,125
Deep Creek	N. C.	139,922	17,061		13,291		7,051	12,209	189,534
Dutchman Creek	N. C.	41,259			23,627		20,102	8,499	93,487
Little Yadkin River	N. C.	18,325			11,000		1,840	3,117	34,282
Muddy Creek	N. C.	37,803	1,819		1,959		4,495	4,608	50,684
Stewarts-Lovills Creek	N. C.	28,548			18,520		3,650	4,047	54,765
Town Fork Creek	N. C.	75,285	4,779		4,317		877	8,526	93,784
Big Creek	S. C.	4,867	231	2,598				311	8,007
Broad Mouth Creek	S. C.	5,297			1,200			316	6,813
Coneross Creek	S. C.	5,190					165		5,355
Georges Creek	S. C.	9,616	611		1,260			614	12,101
South Tyger River	S. C.	6,860	2,463		10,920		14,038	4,495	38,776
Thicketty Creek	S. C.	37,975			5,650		266	857	44,748
Three & Twenty Creek	S. C.	39,110	1,515		300			334	41,259
Wilson Creek	S. C.	5,871	259		2,833		1,736	570	11,269
Total		690,629	46,965	2,598	102,196		101,187	57,985	1,001,560
WATER SUB-REGION E									
Blue Eye Creek	Ala.	10,049	3,810	3,137	1,851		417	2,201	21,465
Cheaha Creek	Ala.	34,860	3,699		7,140			3,939	49,638
Choccolocco Creek	Ala.	169,611	33,810		10,223			14,749	228,393
Crooked Creek	Ala.	10,672	2,916					601	14,189
Ketchepedrake Creek	Ala.	24,814	7,134					2,167	34,115
Lost Creek	Ala.	7,851	1,164		550			735	10,300
Mill Creek	Ala.			17,640	3,750			3,200	24,590
Terrapin Creek	Ala.	144,979	9,432		2,927			16,143	173,481
Allatoona Creek	Ga.	219			1,842		2,408	447	4,916
Big Cedar Creek	Ga.	41,475			995		8,654	5,112	56,236
Cartecay River	Ga.	10,072	2,228		5,572		977	1,080	19,929
Ellijay River	Ga.	11,758	612	8,352	4,951		4,827	2,370	32,870
Euharlee Creek	Ga.	42,196		17,300	253		7,654	6,740	74,143
Etowah River Reach	Ga.	52,437					16,690	6,913	76,040
Grove River	Ga.	50,444			1,176		4,200	9,073	64,893
Haynes Creek-Brushy Fork	Ga.	13,258					1,046		14,304
Head of Little Tennessee R.	Ga.	13,285	6,339		1,359		4,467	2,545	27,995
Hiawassee River	Ga.	2,708	4,157				1,005	687	8,557
Little River	Ga.	47,210	2,644		5,950		15,657	2,689	74,150
Little River	Ga.	14,390	462		4,795		8,053	1,343	29,043

TABLE XXVII - C (continued)
Upstream Watersheds - Authorized for Installation Projects - Average Annual Flood Damages
(Dollars)

Watershed Name	State	Crop & Pasture	Other Agriculture	Residential & Commercial	Road & Bridge	Railroad	Sediment & Erosion	Indirect	Total
WATER SUB-REGION E (continued)									
Little Tallapoosa River	Ga.	76,722	3,642		3,622		1,943	1,273	87,202
Long Swamp Creek	Ga.	14,104	350	28,922	3,147		2,100	3,519	52,142
Lower Little Tallapoosa R.	Ga.	69,420			15,697		6,550	3,132	94,799
Middle Fork Broad River	Ga.	7,334	3,876		2,582		2,104	1,589	17,485
Mill-Canton Creek	Ga.	24,975	1,587		5,301		4,406	1,253	37,522
Mountaintown Creek	Ga.	12,934	554		2,905		1,262	588	18,243
Noonday Creek	Ga.	8,186	2,280		4,950		2,475		17,891
North Broad River	Ga.	21,792			1,841		1,343	509	25,485
Pine Log Tributary	Ga.	37,398			3,963		20,414	6,178	67,953
Pumpkinvine Creek	Ga.	34,566					17,577		52,143
Raccoon Creek	Ga.	39,127	1,224		2,153		1,956	1,393	45,853
Sallacoa Creek Area	Ga.	41,477			8,152		14,450	6,408	70,487
Sharp Mountain Creek	Ga.	26,433	22,683		11,250		4,197		64,563
Stamp-Shoal Creek	Ga.	12,138					1,587	696	14,421
Talking Rock Creek	Ga.	10,682	1,924		2,051		7,133	752	22,542
Chiwapa Creek	Miss.	279,594	25,634		7,941		14,376	32,754	360,299
Chuquatonchee Creek	Miss.	324,386			34,086		1,988	28,826	389,286
Gray's Creek	Miss.	99,736	2,493		3,925		8,674	4,159	118,987
Houlka Creek	Miss.	300,546			53,719			27,568	381,833
Muddy Creek	Miss.	187,487	25,359		11,805		19,389	11,161	255,201
Tallahaga Creek	Miss.	64,119			22,204			4,715	91,038
Town Creek	Miss.	600,707	18,733	30,439	19,844		5,475	67,520	742,718
Tuscumbia Creek	Miss.	453,882			38,685			49,257	541,824
W. Hatchie Creek	Miss.	95,676	4,887		6,325		19,147	1,886	127,921
L. Tippah River	Miss.	144,310	30,230				483	17,502	192,525
Mill Creek	Miss.	23,848			11,250		2,410	2,626	40,134
N. Tippah Creek	Miss.	22,535	4,800					2,734	30,069
Oaklimeter Creek	Miss.	103,233	2,782		9,635		92	4,562	120,304
U. Tippah River	Miss.	3,455						346	3,801
Locks Creek	Miss.	28,013					490	2,205	30,708
Little Spring-Ochewalla Cr.	Miss.	26,127					20,812		46,939
Hell Creek	Miss.	50,116						3,150	53,266
Duncan-Cane	Miss.	30,673			2,135		1,142	3,269	37,219
Cypress, etc. Creek	Miss.	29,856			11,158		827	8,368	50,209
Cane Creek	Miss.	20,747			3,294		204	1,788	26,033
Pigeon Roost Creek	Miss.	124,171					81,753	20,592	226,516
Cold Water River	Miss.	215,718					14,461	17,569	247,748
Fair Creek	Miss.	5,951						181	6,132
U. Skuna River	Miss.	71,869							71,869
Total		4,446,331	231,445	105,790	356,954		357,275	422,762	5,920,557

TABLE XXVII - C (continued)

Upstream Watersheds - Authorized for Installation Projects - Average Annual Flood Damages

(Dollars)

Watershed Name	State	Crop & Pasture	Other Agriculture	Residential & Commercial	Road & Bridge	Railroad	Sediment & Erosion	Indirect	Total
WATER SUB-REGION F									
Conewango Creek	N. Y.	149,719	17,544	9,642	34,402		36,115	24,359	271,581
Ischua Creek	N. Y.	6,819	3,181	34,734	6,700		9,273	14,355	75,062
Dunlap Creek	Pa.	1,018		38,124	115			7,750	47,007
Harmon Creek	Pa.			81,233	7,588		375	17,764	106,960
Little Shenango River	Pa.	1,025	139	53,702				12,848	67,714
Oil Creek	Pa.	965	786	172,256	1,054		304	34,868	210,233
Sandy Creek	Pa.			19,741			137	3,948	23,826
Polk Creek	W. Va.			27,815	4,908		2,419	6,545	41,687
U. Deckers Creek	W. Va.	13,968		13,028	5,233			3,793	36,022
U. Buffalo Creek	W. Va.	1,124	533	223,800	1,770		902	26,011	254,140
Wheeling Creek	W. Va.	989		225,705	22,204		2,503	25,140	276,541
Total		175,627	22,183	899,780	83,774		52,028	177,381	1,410,773
WATER SUB-REGION G									
Buffalo Creek	Ohio	25,403	1,124	490	3,650			3,101	33,768
Margaret Creek	Ohio	10,475	883		8,564			2,236	22,158
Rush Creek	Ohio	89,299	3,326	19,235	12,721			14,781	139,362
W. Fr. Duck Creek	Ohio	21,423	1,772	16,207	28,784			10,869	79,055
S. Fr. Roanoke River	Va.	2,136	322	13,547	7,751		5,036	4,990	33,782
Big Ditch Run	W. Va.			17,242	5,291			3,380	25,913
Blakes & Armours at Nitro	W. Va.			18,697	140			1,884	20,721
Brush Creek	W. Va.	5,065	4,300	53,277	14,400			14,395	91,437
Pecks Run	W. Va.	2,562		10,508	1,368			1,745	16,183
Saltlick Creek	W. Va.	4,772	3,107		6,606	25,094	2,421	7,283	49,283
Shooks Run	W. Va.	46		1,795	335			331	2,507
Total		161,181	14,834	150,998	89,610	25,094	7,457	64,995	514,169
WATER SUB-REGION H									
Buck Creek	Ky.	11,740	770		580		4,320	1,740	19,150
Fox Creek	Ky.	10,980	4,632	4,582	3,078			2,680	25,952
Total		22,720	5,402	4,582	3,658		4,320	4,420	45,102
WATER SUB-REGION I									
Mill Creek	Ky.	3,380	350		310			420	4,460
Jennings Creek	Tenn.	54,804	28,625	11,631	19,131		25,528	13,972	153,691
Line Creek	Tenn.	16,041	9,600	2,500	30,000		1,647	9,452	69,240
Mill Creek	Tenn.	4,957	1,740		16,649		775	4,027	28,148
Total		79,182	40,315	14,131	66,090		27,950	27,871	255,539

TABLE XXVII - C (continued)
Upstream Watersheds - Authorized for Installation Projects - Average Annual Flood Damages
(Dollars)

Watershed Name	State	Crop & Pasture	Other Agriculture	Residential & Commercial	Road & Bridge	Railroad	Sediment & Erosion	Indirect	Total
WATER SUB-REGION J									
Big Coon Creek	Ala.	31,250	9,732		5,460			5,190	51,632
Big Nance Creek	Ala.	58,559	13,952		2,480			3,960	78,951
Crowdabout Creek 2/	Ala.	50,926	10,592		13,399			6,470	81,387
Hurricane Creek	Ala.	87,919	8,964					8,505	105,388
Town Creek	Ala.	110,882	30,315		3,218			8,968	153,383
Mud Creek 2/	N. C.	156,800	4,693		13,938		16,844	14,854	207,129
Crow Creek	Tenn.	51,196	3,294	7,340	12,340		6,565	10,573	91,308
Lick Creek 2/	Tenn.	310,265	18,406		40,842		9,442	75,791	454,746
Pine Creek	Tenn.	3,876		33,559	5,500		2,676	7,703	53,314
Roarks Cove	Tenn.	7,409	1,080		2,000		935	1,396	12,820
Shady Valley	Tenn.	23,181							23,181
Total		892,263	101,028	40,899	99,177		36,462	143,410	1,313,239
Grand Total		6,630,279	702,123	2,013,002	1,237,250	64,392	787,536	1,174,694	12,609,276

1/ As of June 30, 1967.
2/ Inactive.

TABLE XXVII-C (1)

Summary - Upstream Watersheds - Authorized for Installation Projects - Average Annual Flood Damages (Dollars)

Sub-Region	Crop and Pasture	Other Agriculture	Residential and Commercial	Road and Bridge	Railroad	Sediment and Erosion	Indirect	Total
A	10,814	11,244	197,970	87,340	32,544	8,211	57,586	405,709
B	138,030	227,489	596,254	345,483	6,754	187,830	216,849	1,718,689
C	13,502	1,218		2,968		4,816	1,435	23,939
D	690,629	46,965	2,598	102,196		101,187	57,985	1,001,560
E	4,446,331	231,445	105,790	356,954		357,275	422,762	5,920,557
F	175,627	22,183	899,780	83,774		52,028	177,381	1,410,773
G	161,181	14,834	150,998	89,610	25,094	7,457	64,995	514,169
H	22,720	5,402	4,582	3,658		4,320	4,420	45,102
I	79,182	40,315	14,131	66,090		27,950	27,871	255,539
J	892,263	101,028	40,899	99,177		36,462	143,410	1,313,239
Total	6,630,279	702,123	2,013,002	1,237,250	64,392	787,536	1,174,694	12,609,276

TABLE XXVII - D

Upstream Watersheds - Authorized for Installation Projects 1/ - Average Annual Benefits (Dollars)

Watershed Name	State	Damage Reduction	More Intensive Land Use	Changed Land Use	Urban Land Enhancement	Drainage	Irrigation	M & I Water Supply	Recreation	Fish and Wildlife	Secondary	Redevelopment	Incidental Recreation	Total
WATER SUB-REGION A														
Brodhead Creek	Pa.	66,310			767									67,077
Green-Dreher Tribs.	Pa.	159,594												159,594
Lackawazan Tribs.	Pa.	12,181												12,181
Little Schuylkill River	Pa.	107,109												107,109
Mauch Chunk Creek	Pa.	8,425						7,000	180,000		28,400	5,300		229,125
Total		353,619			767			7,000	180,000		28,400	5,300		575,086
WATER SUB-REGION B														
Little Youghiogheny R.	Md.	51,553 (3)		4,898				17,827	98,800			7,725		180,803
Genegantslet Creek	N. Y.	2,748							8,871					11,619
L. Chocnut, Finch Hollow, Trout Brook	N. Y.	64,492									5,383			69,875
Nanticoke Creek	N. Y.	25,000	725		111,066									136,791
Patterson, Brixius, Grey Creek	N. Y.	20,203									1,668			21,871
Upper Five Mile Cr.	N. Y.	21,702				26,580								48,282
Briar Creek	Pa.	9,782			7,080				31,420		868	3,730		52,880
Marsh Creek	Pa.	58,677	1,310					8,398	31,890		10,803	5,134		116,212
Martin Creek	Pa.	14,547												14,547
Middle Creek	Pa.	86,170	3,135					7,200	190,000		26,650	8,900		322,055
Mill Creek	Pa.	38,224												38,224
Lunice Creek	W. Va.	64,112	9,604								5,600		1,493	80,809
New Creek - Whites Run	W. Va.	73,844		230										74,074
Patterson Creek	W. Va.	206,038	46,153		19,613			3,600						275,404
South Fork	W. Va.	395,996												395,996
Total		1,133,088	60,927	5,128	137,759	26,580		37,025	360,981		50,972	25,489	1,493	1,839,442
WATER SUB-REGION C														
Johns Creek	Va.	21,113		11,532							3,207			35,852
WATER SUB-REGION D														
Little Sandy & Trail Creek	Ga.	16,847	16,569						214,500		29,194	19,217		296,327
Middle Oconee-Walnut Creek	Ga.	77,817	70,634					2,100			33,235		1,214	185,000
Sandy Creek	Ga.	14,490	8,192											22,682

TABLE XXVII - D (continued)

Upstream Watersheds - Authorized for Installation Projects 1/ - Average Annual Benefits (Dollars)

Watershed Name	State	Damage Reduction	More Intensive Land Use	Changed Land Use	Urban Land Enhancement	Drainage	Irrigation	M & I Water Supply	Recreation	Fish and Wildlife	Secondary	Redevelopment	Incidental Recreation	Total
WATER SUB-REGION D (continued)														
South Fork of Broad River	Ga.	37,902	30,405				8,138	4,836			16,880	8,630		106,791
South Fork	Ga.	29,927	31,494											61,421
Abbotts Creek 2/	N.C.	74,075												74,075
Deep Creek	N.C.	111,241												111,241
Dutchman Creek	N.C.	71,081	62,382								20,509		3,600	157,572
Little Yadkin River	N.C.	28,378	5,000								3,093			36,471
Muddy Creek	N.C.	39,949												39,949
Stewarts-Lovills Cr.	N.C.	43,520	26,045		25,200			2,310			12,041			109,116
Town Fork Creek	N.C.	66,069	7,432	5,447										78,948
Big Creek	S.C.	7,859	2,232					4,961			3,254		3,177	21,483
Broad Mouth Creek	S.C.	4,638	3,494											8,132
Coneross Creek	S.C.	3,551		21,730										25,281
Georges Creek	S.C.	10,666	5,873					4,323			6,045	3,583	9,435	39,925
South Tyger River	S.C.	32,497	17,051					675			12,875	6,193	9,390	78,681
Thicketty Creek	S.C.	38,329	21,654											59,983
Three and Twenty Cr.	S.C.	40,294	7,023								15,286		16,280	78,883
Wilson Creek	S.C.	9,986	6,480								3,936		4,798	25,200
Total		759,116	321,960	27,177	25,200		8,138	19,205	214,500		156,348	37,623	47,894	1,617,161
WATER SUB-REGION E														
Blue Eye Creek	Ala.	15,533	3,505								2,337		277	21,652
Cheaha Creek	Ala.	40,314	17,920								13,480		8,900	80,614
Choccolocco Creek	Ala.	194,354	60,870	9,439				198,613	52,500		35,533		11,580	562,889
Crooked Creek	Ala.	12,507	9,865	5,731				5,952			4,710	8,772	8,743	56,280
Ketchepedrake Creek	Ala.	29,489	16,275								5,935	6,911	5,960	64,570
Lost Creek	Ala.	7,244	12,631											19,875
Mill Creek	Ala.	24,590	1,300		106,470						10,728			143,088
Terrapin Creek	Ala.	92,922	18,991								7,037			118,950
Allatoona Creek	Ga.	4,145												4,145
Big Cedar Creek	Ga.	52,545	33,932						60,000		24,244	11,822		182,543
Cartecay River	Ga.	23,538(3)	20,049											43,587
Ellijay River	Ga.	26,215	21,309								7,870	9,090	10,577	75,061
Euharlee Creek	Ga.	47,958	68,659						64,500		22,831	11,751		215,699
Etowah River Reach	Ga.	65,418	61,231											126,649
Grove River	Ga.	62,539	40,111					4,500			17,744	18,569		143,463
Haynes Creek - Brushy Fork	Ga.	13,748	13,100											26,848
Head of Little Tennessee	Ga.	17,165	3,511											20,676

TABLE XXVII - D (continued)

Upstream Watersheds - Authorized for Installation Projects 1/ - Average Annual Benefits (Dollars)

Watershed Name	State	Damage Reduction	More Intensive Land Use	Changed Land Use	Urban Land Enhance-ment	Drain-age	Irriga-tion	M & I Water Supply	Recreation	Fish and Wildlife	Secondary	Rede-velop-ment	Inci-dental Recrea-tion	Total
WATER SUB-REGION E (continued)														
Hiawassee River	Ga.	6,687	15,443						4,950		7,648	15,807	7,095	57,630
Little River	Ga.	70,862												70,862
Little River	Ga.	24,952	15,969					4,828			8,900	7,737		62,386
Little Tallapoosa R.	Ga.	83,417						13,230	10,220					106,867
Long Swamp Creek	Ga.	45,152	4,690								7,024	9,152		66,018
Lower Little Tallapoosa	Ga.	82,614	58,406					29,019			28,805	23,533	3,962	226,339
Middle Fork Broad R.	Ga.	12,309	42,978											55,287
Mill-Canton Creek	Ga.	55,747(3)												55,747
Mountaintown Creek	Ga.	24,425(3)												24,425
Noonday Creek	Ga.	11,471	71 027											82,498
North Broad River	Ga.	21,748	11,613								980	1,544	1,437	37,322
Pine Log Tributary	Ga.	(3) 108,104	47,846						25,875		22,485	17,060		221,370
Pumpkinvine Creek	Ga.	47,013	83,997											131,010
Raccoon Creek	Ga.	37,937												37,937
Sallacoa Creek Area	Ga.	(3) 81,034	52,690					3,204	60,375		26,012	35,412		258,727
Sharp Mountain Creek	Ga.	57,547	86,586											144,133
Stamp-Shoal Creek	Ga.	12,817	7,924											20,741
Talking Rock Creek	Ga.	16,905	15,969								5,880	6,796		45,550
Chiwapa Creek	Miss.	274,782							17,382					292,164
Chuquatonchee Creek	Miss.	169,994												169,994
Gray's Creek	Miss.	107,493												107,493
Houlka Creek	Miss.	191,589							21,500		35,743		3,254	252,086
Muddy Creek	Miss.	236,745												236,745
Tallahaga Creek	Miss.	76,504		23,378							24,899			124,781
Town Creek	Miss.	498,104	122,292		15,667				96,612		66,157			798,832
Tuscumbia Creek	Miss.	366,556												366,556
W. Hatchie Creek	Miss.	122,694												122,694
L. Tippah River	Miss.	157,243	1,060	5,165					65,112		15,790			244,370
Mill Creek	Miss.	25,771												25,771
N. Tippah Creek	Miss.	20,548												20,548
Oaklimeter Creek	Miss.	115,629	1,408											117,037
U. Tippah River	Miss.	3,109												3,109
Locks Creek	Miss.	18,221	5,513	2,904							8,650			35,288
Little Spring - Ochewalla Creek	Miss.	53,320(3)												53,320
Hell Creek	Miss.	44,782									5,687			50,469
Duncan-Cane Creek	Miss.	33,523												33,523
Cypress, etc. Creek	Miss.	33,581	26,578	4,519										64,678
Cane Creek	Miss.	14,506												14,506
Pigeon Roost Creek	Miss.	92,971												92,971
Coldwater River	Miss.	203,360									25,365			228,725

TABLE XXVII - D (continued)

Upstream Watersheds - *Authorized for Installation Projects* 1/ - Average Annual Benefits (Dollars)

Watershed Name	State	Damage Reduction	More Intensive Land Use	Changed Land Use	Urban Land Enhancement	Drainage	Irrigation	M & I Water Supply	Recreation	Fish and Wildlife	Secondary	Redevelopment	Incidental Recreation	Total
WATER SUB-REGION E (continued)														
Fair Creek	Miss.	5,826												5,826
U. Skuna River	Miss.	71,445												71,445
Total		4,469,261	1,075,248	51,136	122,137			259,346	479,026		442,474	183,956	61,785	7,144,369
WATER SUB-REGION F														
Conwango Creek	N.Y.	224,164				6,533				109,302	31,981			371,980
Ischua Creek	N.Y.	56,203	1,064							58,500	4,844			120,611
Dunlap Creek	Pa.	45,570												45,570
Harmon Creek	Pa.	94,978						1,700						96,678
Little Shenango River	Pa.	64,903							39,800		5,158	5,098		114,959
Oil Creek	Pa.	199,990										9,100		209,090
Sandy Creek	Pa.	23,047												23,047
Polk Creek	W. Va.	32,611												32,611
U. Deckers Creek	W. Va.	34,045									5,677	4,504	4,647	48,873
U. Buffalo Creek	W. Va.	214,942							14,900		21,578			251,420
Wheeling Creek	W. Va.	266,200							113,000		24,700	51,000		454,900
Total		1,256,653	1,064			6,533		1,700	167,700	167,802	93,938	69,702	4,647	1,769,739
WATER SUB-REGION G														
Buffalo Creek	Ohio	25,823	7,523	584				2,334			4,407	2,040	7,961	50,672
Margaret Creek	Ohio	17,676	5,488	224				5,538	47,025	7,438	8,659	2,065	2,060	96,173
Rush Creek	Ohio	117,411	4,309	43,808				12,270	20,729		25,207	8,281	20,099	252,114
W. Fr. Duck Creek	Ohio	70,566	10,607	5,427				2,472	87,980		19,807	33,283		230,142
S. Fr. Roanoke River	Va.	30,586	4,471		32,105						18,804			85,966
Big Ditch Run	W. Va.	23,861							65,090		2,214	8,596		99,761
Blakes & Armours at Nitro	W. Va.	19,759							19,000		2,059	3,400		44,218
Brush Creek	W. Va.	70,342		3,491				54,352	45,745		5,956	13,950		193,836
Pecks Run	W. Va.	15,112									1,844	2,046		19,002
Saltlick Creek	W. Va.	31,221												31,221
Shooks Run	W. Va.	2,189									187	436		2,812
Total		424,546	32,398	53,534	32,105			76,966	285,569	7,438	89,144	74,097	30,120	1,105,917
WATER SUB-REGION H														
Buck Creek	Ky.	13,430	6,010	6,790										26,230
Fox Creek	Ky.	20,126	11,248						16,300		8,060	3,270		59,004
Total		33,556	17,258	6,790					16,300		8,060	3,270		85,234

TABLE XXVII - D (continued)

Upstream Watersheds - Authorized for Installation Projects 1/ - Average Annual Benefits (Dollars)

Watershed Name	State	Damage Reduction	More Intensive Land Use	Changed Land Use	Urban Land Enhancement	Drainage	Irrigation	M & I Water Supply	Recreation	Fish and Wildlife	Secondary	Redevelopment	Incidental Recreation	Total
WATER SUB-REGION I														
Mill Creek	Ky.	2,690	850	2,090				3,490	18,080		3,690	3,580		34,470
Jennings Creek	Tenn.	109,156												109,156
Line Creek	Tenn.	54,543	28,148											82,691
Mill Creek	Tenn.	22,928	7,724											30,652
Total		189,317	36,722	2,090				3,490	18,080		3,690	3,580		256,969
WATER SUB-REGION J														
Big Coon Creek	Ala.	35,107									3,722	3,713		42,542
Big Nance Creek	Ala.	66,873	41,866					5,692			21,865			136,296
Crowdabout Creek 2/	Ala.	71,785												71,785
Hurricane Creek	Ala.	80,196	12,072											92,268
Town Creek	Ala.	125,657	83,385			1,117	6,425							216,584
Mud Creek 2/	N. C.	126,965												126,965
Crow Creek	Tenn.	53,347									4,728	7,108		65,183
Lick Creek 2/	Tenn.	304,715												304,715
Pine Creek	Tenn.	52,162	2,987	2,240				3,716	50,400					111,505
Roarks Cove (Mud Cr.)	Tenn.	7,960	23,341			1,478					5,621			38,400
Shady Valley	Tenn.	23,181				1,194					6,159	5,525		36,059
Total		947,948	163,651	2,240		3,789	6,425	9,408	50,400		42,095	16,346		1,242,302
Grand Total		9,588,217	1,709,228	159,627	317,968	36,902	14,563	414,140	1,772,556	175,240	918,328	419,363	145,939	15,672,071

1/ As of June 30, 1967.
2/ Inactive.
(3) **Includes other than flood damage reduction benefits and in some cases benefits from outside of watershed. Data were not available for complete breakdown.**

TABLE XXVII-D (1)

Summary - Upstream Watersheds - Authorized for Installation Projects - Average Annual Benefits (Dollars)

Sub-Region	Damage Reduction	More Intensive Land Use	Changed Land Use	Urban Land Enhancement	Drainage	Irrigation	M & I Water Supply	Recreation	Fish and Wildlife	Secondary	Redevelopment	Incidental Recreation	Total
A	353,619			767			7,000	180,000		28,400	5,300		575,086
B	1,133,088	60,927	5,128	137,759	26,580		37,025	360,981		50,972	25,489	1,493	1,839,442
C	21,113		11,532							3,207			35,852
D	759,116	321,960	27,177	25,200		8,138	19,205	214,500		156,348	37,623	47,894	1,617,161
E	4,469,261	1/ 1,075,248	51,136	122,137			259,346	479,026		442,474	183,956	61,785	7,144,369
F	1,256,653	1,064			6,533		1,700	167,700	167,802	93,938	69,702	4,647	1,769,739
G	424,546	32,398	53,534	32,105			76,966	285,569	7,438	89,144	74,097	30,120	1,105,917
H	33,556	17,258	6,790					16,300		8,060	3,270		85,234
I	189,317	36,722	2,090				3,490	18,080		3,690	3,580		256,969
J	947,948	163,651	2,240		3,789	6,425	9,408	50,400		42,095	16,346		1,242,302
Total	9,588,217	1,709,228	159,627	317,968	36,902	14,563	414,140	1,772,556	175,240	918,328	419,363	145,939	15,672,071

1/ Includes $61,732 benefits outside the watersheds.

TABLE XXVIII - A

Upstream Watersheds - Potential - Ohio River Basin (Type I) 1/
Structural Measures

Water Sub-Region	Number of Watersheds	Watershed Area	Number of Structures	Drainage Area Controlled	STORAGE: Sediment & Floodwater 2/	STORAGE: Other Beneficial Uses 3/	STORAGE: Total	Surface Area	Estimated Flood Channel Improvement
	(No.)	(Sq. Mi.)	(No.)	(Sq. Mi.)	(Ac. Ft.)	(Ac. Ft.)	(Ac. Ft.)	(Acres)	(Miles)
B	1	464	25	221	47,984	17,895	65,879	3,692	
F	24	5,026	164	1,136	226,387	458,655	685,042	32,804	17
G	66	5,008	369	1,642	319,621	1,549,231	1,868,852	66,559	592
H	10	1,168	51	671	155,985	180,486	264,471	11,032	16
I	19	1,213	89	562	181,772	595,767	777,539	22,991	169
J	3	586	28	260	75,535	230,031	305,566	13,171	36
Total	123	13,465	726	4,492	1,007,284	2,960,065	3,967,349	150,249	830

1/ From Ohio River Basin Comprehensive Survey - 1968.
2/ To crest of emergency spillway.
3/ Storage for beneficial uses other than flood prevention.

TABLE XXVIII- B

Upstream Watersheds - Potential - Ohio River Basin Study (Type I) 1/
Average Annual Flood Damages and Benefits (Dollars)

Water Sub-Region	Number of Watersheds	AVERAGE ANNUAL DAMAGES: Crop and Pasture	Other Agriculture	Non-Agri-cultural	Sediment and Erosion	Transpor-tation Facilities	Urban	Indirect	Total	BENEFITS: Damage Reduction 2/	Other 3/	Flood Plain Area
	(No.)											(Acres)
B	1	3, 385				30, 884	192, 864	37, 729	264, 862			3, 215
F	24	40, 591	16, 398	9, 250	1, 000	210, 272	1, 287, 748	212, 956	1, 778, 215		369, 650	51, 951
G	66	812, 501	103, 880	14, 950	15, 206	274,023	1, 487, 297	275, 939	2, 983, 796		633, 801	98, 015
H	10	111, 163	13, 226		3, 678	19, 126	77, 740	23, 910	248, 843		28, 606	12, 341
I	19	205, 821	20, 648		19, 565	48, 691	74, 060	52, 545	422, 330		352, 008	19, 476
J	3	47, 712	9, 396		6, 734	16, 200	33, 300	18, 819	132, 161		72, 800	7, 090
Total	123	1, 221, 173	163,548	24, 200	46, 183	599, 196	3, 153, 009	622, 898	5, 830, 207		1, 456, 865	192, 088

1/ From Ohio River Basin Comprehensive Survey - 1966.
2/ Damage reduction estimated at 80 per cent.
3/ Includes productivity benefits due to restoration, intensification, and changed land use.

TABLE XXIX

Upstream Watersheds - Potomac River Basin Study, 1963 - Water Sub-Region B

No.	Name	State	Project Area	No. of Structures	Drainage Area Controlled	Sediment		Flood Prevention		M & I Water Supply		Water Quality		Total		Total First Costs	Average Annual (FP only) Costs	Average Annual (FP only) Benefits
			(Sq.Mi.)	(No.)	(Sq.Mi.)	(Ac.)	(AF)	(Ac.)	(AF)	(Ac.)	(AF)	(Ac.)	(AF)	(Ac.)	(AF)	(Dollars)	(Dollars)	(Dollars)
3	North Branch	Md.	297.3	2	12.2	24	325	93	2,276					100	2,601	185,400	7,416	10,508
10	N. Fork S. Branch	W.Va.	340.8	4	59.6	104	1,592	329	11,114					347	12,706	1,807,500	72,300	149,889
11	South Branch	W.Va.	353.0	7	66.6	158	1,779	579	12,420					636	14,199	1,354,525	54,181	135,894
12	Mill Creek	W.Va.	97.0	5	38.3	63	1,023	394	7,142					438	8,165	1,008,625	40,345	80,325
15	Town Creek	Md.	158.0	3	42.8		1,143			618	18,060			679	19,203	1,729,825	80,523	80,523
19	L. Cacapon River	W.Va.	116.1	5	35.1	87	937	316	6,545					337	7,482	778,000	31,120	39,872
20	North River	W.Va.	204.9	6	44.8	136	1,195	399	8,683			65	495	436	10,373	1,254,050	48,982	67,306
22	Lost River	W.Va.	247.5	9	71.8	158	1,917	591	13,390					642	15,307	1,968,750	78,750	142,180
23	Cacapon River	W.Va.	225.1	6	40.1	142	1,071	434	7,478					494	8,549	743,500	29,740	22,919
24	Sleepy Creek	W.Va.	134.0	8	57.2	207	1,528	726	10,667					809	12,195	706,900	28,276	41,797
25	Tonoloway	Md.	116.1	2	28.9	22	772	567	3,571	400	11,720			607	16,063	860,750	15,812	26,796
26	Licking Creek	Md.	219.8	9	66.8	214	1,782	854	12,243	*	1,295	*	4,495	1,163	19,815	1,587,450	38,065	63,745
41	Opequon	W.Va.	339.8	5	64.9	82	1,968	395	1,951			972	21,285	1,734	25,204	1,424,900	11,800	30,976
Total			2,849.4	71	629.1	1,397	17,032	5,677	97,480	1,018	31,075	1,037	26,275	8,422	171,862	15,410,175	537,310	892,640

* Totals 287 acres.

TABLE XXX-A

Upstream Watersheds - Other River Basin Studies - Genesee River Basin 1/
Water Sub-Region F

Watershed Number	Watershed Area	Number of Structures	Drainage Area Controlled	Flood Prevention	Beneficial Use		Total 2/		Total Structural Costs
(No.)	(Sq. Mi.)	(No.)	(Sq. Mi.)	(Ac. Ft.)	(Acre)	(Ac. Ft.)	(Acre)	(Ac. Ft.)	($1,000)
1	85.8	5		26,788	110	3,454	835	30,242	7,750
2	50.1	3		20,862	145	4,938	881	25,800	5,514
3	80.7	4		12,191	548	19,352	797	31,543	6,262
4	72.1	4	38.0	6,372	341	11,891	469	18,263	5,282
5	143.8	6		9,233	316	7,615	616	16,848	5,680
6	59.0	4		4,819	256	8,150	369	12,969	2,315
7	84.5	4		14,400	2,230	43,435	2,578	57,835	5,310
8	87.8	3	21.4	3,723	503	13,005	580	16,728	3,289
9	62.3	1	6.7	1,025	72	1,745	93	2,770	833
10	125.4	7		11,098	964	26,100	1,171	37,198	9,981
Total	851.5	41		110,511	5,485	139,685	8,389	250,196	52,216

1/ As of August 1966.
2/ To crest of emergency spillway.

TABLE XXX - B (1)

Upstream Watersheds - Other River Basin Studies
James River Basin 1/ - Structural Measures - Water Sub-Region C

Watershed Name	State	Watershed Area	No. of Structures	Drainage Area Controlled	Storage Volume by Purpose: Flood Prevention	Storage Volume by Purpose: M & I Water Supply	Storage Volume by Purpose: Recreation	Storage Volume by Purpose: Total 2/	Additional Storage Beneficial Uses	Channel Improvement	Estimated Installation Cost: Identified Needs	Estimated Installation Cost: Full Development	Flood Plain Area
		(Sq. Mi.)	(No.)	(Sq. Mi.)	(Ac. Ft.)	(Ac. Ft.)	(Ac. Ft.)	(Ac. Ft.)	(Ac. Ft.)	(Miles)	($1,000)	($1,000)	(Acres)
Cowpasture River	Va.	388.05	6	184.3	34,855	1,000		35,855	98,275	1.9	5,090.6	7,705.7	6,700
Catawba Creek	Va.	115.27	6	60.4	16,234	11,520	681	28,435	19,965	10.16	3,842.1	4,104.8	1,676
Jackson River 2 3/	Va.	156.50	4	63.4	13,775	1,000		14,775	32,709	7.94	2,398.6	3,349.4	2,075
Dunlap Creek	Va.	121.80	7	44.6	9,525	3,150	390	13,065	21,705		1,966.1	4,895.7	1,850
Jackson River 4	Va.	98.40	1	12.03	2,758	1,000		3,758	5,315		740.9	1,123.5	
Jackson River 5	Va.	114.49	3	37.34	8,118	3,000	626	11,744	16,290		2,689.0	2,974.4	191
Ogle Creek	Va.	45.84	6	43.8	9,345	1,000	220	10,565	23,515		1,692.2	3,458.8	450
Back Creek	Va.	140.82	2	75.7	13,575	500	1,000	15,075	40,370		3,634.2	4,723.7	1,402
Calfpasture River	Va.	186.37	9	64.6	13,865	3,500	325	17,690	30,620		3,907.9	7,468.6	4,457
Potts Creek	Va.	173.30	3	90.5	19,280	1,500	4,390	25,170	30,825		3,619.5	4,378.0	1,845
Total		1,540.84	47	676.67	141,330	27,170	7,632	176,132	319,589	20.00	29,581.1	44,182.6	20,646

1/ As of October 1967.
2/ Crest of emergency spillway.
3/ The U. S. Forest Service will make a detailed study and appraisal to supplement the proposed project before authorization for detailed planning is initiated.

TABLE XXX - B (2)

Upstream Watersheds - Other River Basin Studies
James River Basin 1/ - Multiple-Purpose Structures - Water Sub-Region C

Watershed Name	State	Number of Structures	Flood Prevention		M & I Water Supply	Recreation		Water Quality	Additional Beneficial Storage	Estimated Recreation Days Provided	Population Served by Water Supply
			STORAGE VOLUME AND SURFACE AREA BY PURPOSE								
		(No.)	(Ac. Ft.)	(Acres)2/	(Ac. Ft.)	(Ac. Ft.)	(Acres)	(Ac. Ft.)	(Ac. Ft.)		
Cowpasture River	Va.	2	7,135	840	1,000				18,800		
Catawba Creek	Va.	4	11,297	974	11,520	681	70		10,220	14,400	
Dunlap Creek	Va.	2	2,815	147	3,150	390	25		3,925	5,000	
Jackson River 2 3/	Va.	2	2,975	322	1,000				6,145		270
Jackson River 4	Va.	1	2,758	130	1,000			5,315			500
Jackson River 5	Va.	3	8,118	326	3,000	626	60		16,290	12,800	16,330
Ogle Creek	Va.	2	1,268	116	1,000	220	20		2,120	3,800	
Back Creek	Va.	2	13,575	1,035	500	1,000	120		50,370	24,000	
Calfpasture River	Va.	5	10,803	1,397	3,500	325	30		23,255	3,300	22,230
Potts Creek	Va.	3	19,280	1,379	1,500	4,390	280		30,825	23,600	11,000
Total		26	80,024	6,666	27,170	7,632	605	5,315	167,265	86,900	50,330

1/ As of October 1967.
2/ Crest of emergency spillway.
3/ The U. S. Forest Service will make a detailed study and appraisal to supplement the proposed project before authorization for detailed planning is initiated.

TABLE XXX-B(3)

Upstream Watersheds - Other River Basin Studies
James River Basin 1/ - Average Annual Flood Damages (dollars) - Water Sub-Region C

Watershed Name	State	Crop and Pasture	Other Agriculture	Residential and Commercial	Road and Bridge	Indirect	Total
Cowpasture River	Va.	21,770	7,620	96,290	21,520	26,940	174,140
Catawba Creek	Va.	3,900	1,400	9,600	4,300	3,400	22,600
Dunlap Creek	Va.	3,200	1,290	35,860	4,420	8,570	53,340
Jackson River 2 2/	Va.	4,120	1,440	46,980	6,380	11,330	70,250
Jackson River 4	Va.	10		10,720		2,150	12,880
Jackson River 5	Va.			35,220	2,330	7,460	45,010
Ogle Creek	Va.	140		30,890	3,160	6,030	40,220
Back Creek	Va.	1,720	605	17,140	7,910	5,275	32,650
Calfpasture River	Va.	6,760	2,310	35,120	19,950	12,040	76,180
Potts Creek	Va.	3,060	1,070	26,510	7,300	7,240	45,180
Total		44,680	15,735	344,330	77,270	90,435	572,450

1/ As of October 1967.
2/ The U. S. Forest Service will make a detailed study and appraisal to supplement the proposed project before authorization for detailed planning is initiated.

TABLE XXX-B(4)

Upstream Watersheds - Other River Basin Studies
James River Basin 1/ - Average Annual Benefits (dollars) - Water Sub-Region C

Watershed Name	State	Damage Reduction	More Intensive Land Use	Changed Land Use	Urban Land Enhancement	M & I Water Supply	Recreation	Secondary	Redevelopment	Incidental Recreation	Total	B/C Ratio 2/
Cowpasture River	Va.	129,040	58,640			10,000		23,730	37,370	4,410	263,190	1.56:1
Catawba Creek	Va.	15,700	21,600	7,900		57,600	14,400	11,500	24,900	4,300	157,900	1.2:1
Dunlap Creek	Va.	33,035		8,895		8,800	5,000	5,700	16,430	1,255	79,115	1.2:1
Jackson River 2 3/	Va.	53,040		12,255		8,000		7,510	13,355	1,815	95,975	1.2:1
Jackson River 4	Va.	9,410			390	7,000		810	4,640	500	22,750	0.9:1
Jackson River 5	Va.	38,970		6,520		20,500	12,800	8,010	30,560	1,340	118,700	1.3:1
Ogle Creek	Va.	36,610		4,260		9,500	3,400	5,380	12,600	950	72,700	1.3:1
Back Creek	Va.	30,320		14,380		10,000	24,000	5,230	36,300	1,020	121,250	1.0:1
Calfpasture River	Va.	58,150		44,120		42,000	3,300	15,240		3,820	166,630	1.2:1
Potts Creek	Va.	32,330		25,630		8,000	35,480	8,550	24,020	1,080	135,090	1.1:1
Total		436,605	80,240	123,960	390	181,400	98,380	91,660	220,175	20,490	1,233,300	

1/ As of October 1967.
2/ Feasible projects if B/C ratio is 1.0:1 or greater.
3/ The U. S. Forest Service will make a detailed study and appraisal to supplement the proposed project before authorization for detailed planning is initiated.

TABLE XXX-B(5)
Upstream Watersheds - Other River Basin Studies
James River Basin 1/ - Cost Allocation ($1,000) - Water Sub-Region C

No.	Watershed Name	State	Flood Prevention	M & I Water Supply	Recreation	Total
7	Cowpasture River	Va.	4,942.7	147.9		5,090.6
8	Catawba Creek	Va.	2,611.6	1,132.8	97.8	3,842.2
20	Dunlap Creek	Va.	1,619.0	268.7	78.4	1,966.1
31	Jackson River 2 2/	Va.	2,177.9	220.7		2,398.6
33	Jackson River 4	Va.	543.8	197.1		740.9
34	Jackson River 5	Va.	1,902.0	611.2	175.8	2,689.0
47	Ogle Creek	Va.	1,330.8	291.5	69.9	1,692.2
10	Back Creek	Va.	3,274.9	109.3	250.0	3,634.2
13	Calfpasture River	Va.	3,013.7	840.9	53.2	3,907.8
49	Potts Creek	Va.	2,889.3	243.3	486.9	3,619.5
Total			24,305.7	4,063.4	1,212.0	29,581.1

1/ As of October 1967.
2/ The Forest Service will make a detailed study and appraisal to supplement the proposed project before authorization for detailed planning is initiated.

TABLE XXX-B(6)

Upstream Watersheds - Other River Basin Studies
James River Basin 1/ - Distribution of Structural Costs (dollars) - Water Sub-Region C

No.	Watershed Name	State	Construction	Installation Services	Land Easements, & Rights-of-Way	Administration of Contracts	Installation Cost
10	Back Creek	Va.	2,922,644	476,927	233,300	1,300	3,634,171
13	Calfpasture River	Va.	2,972,920	549,231	383,000	2,700	3,907,851
8	Catawba Creek	Va.	2,477,752	511,085	848,500	4,800	3,842,137
7	Cowpasture River	Va.	3,754,316	618,349	717,400	3,500	5,090,565
20	Dunlap Creek	Va.	1,602,165	303,665	56,795	3,500	1,966,125
33	Jackson River 4	Va.	623,233	98,308	19,075	300	740,916
34	Jackson River 5	Va.	2,213,872	349,211	124,500	1,400	2,688,983
47	Ogle Creek	Va.	1,262,491	253,493	173,680	2,500	1,692,164
49	Potts Creek	Va.	2,394,790	408,870	814,250	1,550	3,619,460
31	Jackson River 2 2/	Va.	1,597,355	351,324	447,750	2,200	2,398,629
	Total		21,821,538	3,920,463	3,815,250	23,750	29,581,001

1/ As of October 1967.
2/ The Forest Service will make a detailed study and appraisal to supplement the proposed project before authorization for detailed planning is initiated.

TABLE XXX-C(1)

Upstream Watersheds - Other River Basin Studies
Kanawha River Basin 1/ - Structural Measures

Watershed Name	State	Water-shed Area	No. of Struc-tures	Drainage Area Controlled	STORAGE VOLUME BY PURPOSE: Flood Preven-tion	M & I Water Supply	Recrea-tion	Irriga-tion	Water Quality	Total 2/	Addi-tional Storage Beneficial Uses	Channel Improve-ment	Estimated Installa-tion Cost: Identi-fied Needs	Flood-plain Area
		(Sq.Mi.)	(No.)	(Ac.Ft.)	(Ac.Ft.)	(Ac.Ft.)	(Ac.Ft.)	(Ac.Ft.)	(Ac.Ft.)	(Ac.Ft.)	(Ac.Ft.)	(Miles)	($1,000)	(Acres)
WATER SUB-REGION G														
Little Stony Creek 3/	Va.	24.11	1	12.25	2,630	670	4,620			7,920			1,165.2	150
Mill Creek	Va.	6.91	2	4.00	845	670				1,515			738.4	32
Peak Creek	Va.	94.28	8	36.20	7,365	3,000	1,750		5,990	18,105	990		4,841.6	740
Ansted Creek	W.Va.	2.01	1	0.53	115	120				235			252.8	
Beaver Creek	W.Va.	38.85	2	10.22	2,130		1,320		7,840	11,290		9.6	1,975.1	860
Grassy Creek	W.Va.	20.66										0.61	244.3	
Cherry River	W.Va.	163.71	4	75.04	13,040	630			1,270	14,940	4,200		4,763.6	
Georges Creek	W.Va.	2.47	3	1.35	300		30			330			877.1	
Glade Creek	W.Va.	12.09										2.13	90.1	166
Howard Creek	W.Va.	91.74	14	44.02	9,620		10,145		1,070	20,835			7,702.1	840
Kellys Creek	W.Va.	24.28	7	14.77	3,050	190	430	190		3,860			2,872.3	150
Lick Branch	W.Va.	1.70	3	1.19	270		105			375		0.72	859.0	
Meadow Creek	W.Va.	28.34	1	3.05	680					680	750	1.75	913.0	410
Mill Creek (Upper)	W.Va.	192.58	7	88.50	18,220	1,730	1,460			21,410			2,695.1	2,600
Piney Creek	W.Va.	137.20	2	32.74	5,950		800		70	6,820		5.64	3,148.6	
Slaughter Creek	W.Va.	13.08	2	9.10	1,980				3,330	5,310			1,969.1	
Trib. of Greenbrier (Gypsy)	W.Va.	1.08	1	0.51	150	310				460			246.9	
Upper Meadow River	W.Va.	205.53	6	89.61	21,025		17,685			38,710		22.5	12,592.2	
Wertz Hollow	W.Va.	0.66	1	0.43	125					125			460.1	
Total		1,061.28	65	423.51	87,495	7,320	38,345	190	19,570	152,920	5,940	42.95	48,406.6	5,948
WATER SUB-REGION I														
Upper Bluestone River	Va.	73.71	4	34.11	6,480				5,000	11,480		0.27	2,580.9	900
Grand Total		1,134.99	69	457.62	93,975	7,320	38,345	190	24,570	164,400	5,940	43.22	50,987.5	6,848

1/ As of October 1967. 2/ Emergency spillway crest.
3/ The U. S. Forest Service will make a detailed study and appraisal to supplement the proposed project before authorization for detailed planning is initiated.

TABLE XXX-C(2)

Upstream Watersheds - Other River Basin Studies
Kanawha River Basin 1/ - Multiple-Purpose Structures

Watershed Name	State	Number of Structures	STORAGE VOLUME AND SURFACE AREA BY PURPOSE								Estimated Recreation Days Provided	Population Served by Water Supply
			Flood Prevention		M & I Water Supply	Recreation		Irriga-tion	Water Quality	Additional Beneficial Storage		
		(No.)	(Ac.Ft.)	(Acres)2/	(Ac.Ft.)	(Ac.Ft.)	(Acres)	(Ac.Ft.)	(Ac.Ft.)	(Ac.Ft.)	(No.)	(No.)
WATER SUB-REGION G												
Little Stony Creek 3/	Va.	1	2,630	335	670	4,620	250				95,000	
Mill Creek	Va.	1	585		670							3,000
Peak Creek	Va.	5	6,405	900	3,000	1,750	150		5,990	990	225,000	10,470
Ansted Creek	W.Va.	1	115	10	120							1,510
Beaver Creek	W.Va.	2	2,130	435		1,320	88		7,840		53,900	
Cherry River	W.Va.	2	7,240	280	630				1,270	4,200		4,110
Georges Creek	W.Va.	1	190	10		30	4				10,300	
Howard Creek	W.Va.	3	4,835	380		10,145	325		1,070		275,600	
Kellys Creek	W.Va.	2	1,350	60	190	430	25	190			14,300	4,000
Lick Branch	W.Va.	1	150	10		105	7				9,500	
Mill Creek (Upper)	W.Va.	2	11,940	620	1,730	1,460	200				93,000	3,500
Piney Creek	W.Va.	1	2,450	105		800	50		70		86,100	
Slaughter Creek	W.Va.	1	1,670	105					3,330			
Trib. of Greenbrier (Gypsy)	W.Va.	1	150	20	310							
Upper Meadow River	W.Va.	2	9,955	2,675	—	17,685	2,000	—	—	—	1,407,500	—
Total		26	51,795	5,945	7,320	38,345	3,099	190	19,570	5,190	2,270,200	26,590
WATER SUB-REGION I												
Upper Bluestone River	Va.	1	2,010	300					5,000			
Grand Total		27	53,805	6,245	7,320	38,345	3,099	190	24,570	5,190	2,270,200	26,590

1/ As of October 1967.
2/ Emergency spillway crest.
3/ The U. S. Forest Service will make a detailed study and appraisal to supplement the proposed project before authorization for detailed planning is initiated.

TABLE XXX-C(3)

Upstream Watersheds - Other River Basin Studies
Kanawha River Basin 1/ - Average Annual Flood Damages (Dollars)

Watershed Name	State	Crop and Pasture	Residential and Commercial	Road and Bridge	Railroad	Indirect	Total
WATER SUB-REGION G							
Little Stony Creek 2/	Va.		6,700	800		1,200	8,700
Mill Creek	Va.		9,000	700		1,500	11,200
Peak Creek	Va.		50,200	6,700		8,600	65,500
Ansted Creek	W.Va.		1,140	950		360	2,450
Beaver Creek	W.Va.	4,300	3,300	17,500		3,800	28,900
Grassy Creek	W.Va.		10,500	3,300		1,400	15,200
Cherry River	W.Va.		14,009	599	3,192	3,600	21,400
Glade Creek	W.Va.	800	300	1,400		600	3,100
Georges Creek	W.Va.		10,100	20,100		5,500	35,700
Howard Creek	W.Va.		67,200	4,500		11,000	82,700
Kellys Creek	W.Va.		20,600	9,000		5,400	35,000
Lick Branch	W.Va.		4,800	23,000		4,200	32,000
Meadow Creek	W.Va.	1,000	18,700	2,300		3,400	25,400
Piney Creek	W.Va.		34,700	31,700		10,700	77,100
Tributary of Greenbrier (Gypsy)	W.Va.		5,600	1,400		1,100	8,100
Upper Meadow River	W.Va.	22,410	45,100	20,000		13,390	100,900
Mill Creek (Upper)	W.Va.	5,200	82,600			8,800	96,600
Slaughter Creek	W.Va.		4,800	17,300		4,400	26,500
Wertz Hollow	W.Va.		9,800	4,100		2,100	16,000
Total		33,710	399,149	165,349	3,192	91,050	692,450
WATER SUB-REGION J							
Upper Bluestone River	Va.		201,000	26,000		34,000	261,000
Grand Total		33,710	600,149	191,349	3,192	125,050	953,450

1/ As of October 1967.
2/ The U. S. Forest Service will make a detailed study and appraisal to supplement the proposed project before authorization for detailed planning is initiated.

TABLE XXX-C(4)

Upstream Watersheds - Other River Basin Studies
Kanawha River Basin 1/ - Average Annual Benefits (dollars)

Watershed Name	State	Damage Reduction	More Intensive Land Use	Changed Land Use	Urban Land Enhancement	Drainage	Irrigation	M & I Water Supply	Recreation	Secondary	Redevelopment	Incidental Recreation	Water Quality	Total	B/C Ratio 2/
WATER SUB-REGION G															
Little Stony Creek 3/	Va.	8,200						2,000	125,000	13,500	12,400			161,100	2.7:1
Mill Creek	Va.	11,200						8,000		1,900	6,100			27,200	1.1:1
Peak Creek	Va.	59,500							201,300	28,400	53,100		30,600	372,900	1.4:1
Ansted Creek	W.Va.	1,840						8,500		1,000	1,900	3,200		16,440	1.9:1
Beaver Creek	W.Va.	25,300	19,400			16,200			80,900		24,600		50,000	216,400	2.5:1
Grassy Creek	W.Va.	15,100								1,500	1,900			18,500	1.9:1
Cherry River	W.Va.	20,400						6,800			110,300	37,500	34,400	209,400	1.3:1
Glade Creek	W.Va.	2,800								300	700			3,800	1.0:1
Georges Creek	W.Va.	24,100							15,500	2,000	7,600			49,200	1.4:1
Howard Creek	W.Va.	71,600	3,400						413,200		115,800	11,700	15,100	630,800	2.0:1
Kellys Creek	W.Va.	31,300	1,300				3,300	16,300	21,500		26 800	13,200		113,700	1.2:1
Lick Branch	W.Va.	30,000							14,300	10,200		1,000		55,500	1.6:1
Meadow Creek	W.Va.	25,400								2,500	7,800	2,200		37,900	1.2:1
Piney Creek	W.Va.	74,000			8,900				129,200		34,300	9,600	300	256,300	1.9:1
Trib. of Greenbrier (Gypsy)	W.Va.	7,800						8,300		1,500	1,900	4,500		24,000	2.8:1
Upper Meadow R.	W.Va.	100,200		32,980	12,800				2,111,300		158,500		31,000	2,446,780	3.1:1
Mill Creek (Upper)	W.Va.	88,000						22,000	113,000		8,300	16,763		248,063	2.5:1
Slaughter Creek	W.Va.	20,600						23,000			17,200		1,400	62,200	1.0:1
Wertz Hollow	W.Va.	16,000									4,100			20,100	1.3:1
Total		633,340	24,100	32,980	21,700	16,200	3,300	94,900	3,225,200	62,800	593,300	99,663	162,800	4,970,283	
WATER SUB-REGION I															
Upper Bluestone River, Va.		143,000								12,400	18,900	11,600	30,000	215,900	2.5:1
Grand Total		776,340	24,100	32,980	21,700	16,200	3,300	94,900	3,225,200	75,200	612,200	111,263	192,800	5,186,183	

1/ As of October 1967.
2/ Feasible project if B/C ratio is 1.0:1 or greater.
3/ The U. S. *Forest Service will make a detailed study and appraisal to supplement the proposed project before authorization for detailed planning is initiated.*

TABLE XXX-C(5)

Upstream Watersheds - Other River Basin Studies
Kanawha River Basin 1/ - Cost Allocation ($1,000)

No.	Watershed Name	State	Flood Prevention	M & I Water Supply	Recreation	Basic Facilities	Irrigation	Drainage	Water Quality Management	Total
	WATER SUB-REGION G									
42	Little Stony Creek 2/	Va.	195.5	53.3	343.5	572.9				1,165.2
74	Mill Creek	Va.	500.2	238.2						738.4
48	Peak Creek	Va.	1,591.1	914.4	232.6	2,103.5				4,841.6
19	Ansted Creek	W.Va.	123.9	128.9						252.8
21	Beaver Creek	W.Va.	827.8		307.1	197.8		28.5	613.9	1,975.1
22	Grassy Creek	W.Va.	244.3							244.3
25	Cherry River	W.Va.	3,923.3	202.4					637.9	4,763.6
31	Georges Creek	W.Va.	744.1		78.6	54.4				877.1
33	Glade Creek (Upper)	W.Va.	90.1							90.1
36	Howard Creek	W.Va.	4,153.1		2,588.1	661.7			299.2	7,702.1
39	Kellys Creek	W.Va.	2,398.6	89.2	237.0	51.2	96.3			2,872.3
31	Lick Branch	W.Va.	610.2		212.9	35.9				859.0
42	Meadow Creek	W.Va.	913.0							913.0
90	Mill Creek (Upper)	W.Va.	226.8		216.3	77.0				520.1
52	Piney Creek	W.Va.	2,682.4		180.1	276.1			10.0	3,148.6
78	Slaughter Creek	W.Va.	910.9						1,058.2	1,969.1
65	Trib. of Greenbrier (Gypsy)	W.Va.	80.5	166.4						246.9
72	Upper Meadow River	W.Va.	5,650.6		983.9	4,930.1		1,027.6		12,592.2
31	Wertz Hollow	W.Va.	441.4					18.7*		460.1
	Total		26,307.8	1,792.8	5,380.1	8,960.6	96.3	1,074.8	2,619.2	46,231.6
	* Storm-drain laterals									
	WATER SUB-REGION I									
6	Upper Bluestone River	Va.	2,294.3						286.6	2,580.9
	Grand Total		28,602.1	1,792.8	5,380.1	8,960.6	96.3	1,074.8	2,905.8	48,812.5

1/ As of October 1967.
2/ The U. S. Forest Service will make a detailed study and appraisal to supplement the **proposed project before authorization for detailed planning is initiated.**

TABLE XXX-C(6)

Upstream Watersheds - Other River Basin Studies
Kanawha River Basin 1/ - Distribution of Structural Costs (dollars)

No.	Watershed Name	State	Construction	Installation Services	Land Easements, & Rights-of-way	Administration of Contracts	Installation Cost
	WATER SUB-REGION G						
19	Ansted Creek	W.Va.	184,700	42,500	25,400	200	252,800
21	Beaver Creek	W.Va.	1,455,800	323,700	193,700	1,900	1,975,100
22	Grassy Creek	W.Va.	166,300	43,200	34,500	300	244,300
25	Cherry River	W. Va.	3,988,600	618,200	156,000	800	4,763,600
33	Glade Creek	W.Va.	63,400	19,700	6,800	200	90,100
36	Howard Creek	W.Va.	5,941,500	1,124,100	633,100	3,400	7,702,100
39	Kellys Creek	W.Va.	2,235,100	410,700	224,800	1,700	2,872,300
42	Meadow Creek	W.Va.	757,800	133,900	20,900	400	913,000
52	Piney Creek	W.Va.	2,022,500	505,300	617,700	3,100	3,148,600
65	Trib. of Greenbrier (Gypsy)	W.Va.	186,900	43,000	16,800	200	246,900
72	Upper Meadow River	W.Va.	8,918,200	1,793,500	1,877,500	3,000	12,592,200
90	Mill Creek (Upper)	W.Va.	1,554,300	345,300	786,000	9,500	2,695,100
78	Slaughter Creek	W.Va.	1,512,800	247,100	208,800	400	1,969,100
31	Wertz Hollow	W.Va.	331,900	83,100	44,300	800	460,100
31	Lick Branch	W.Va.	608,700	143,500	105,300	1,500	859,000
31	Georges Creek	W.Va.	658,700	151,800	65,700	900	877,100
42	Little Stony Creek 2/	Va.	917,000	184,000	63,500	700	1,165,200
74	Mill Creek	Va.	616,800	118,900	2,300	400	738,400
48	Peak Creek	Va.	3,628,900	819,400	390,900	2,400	4,841,600
	Total		35,749,900	7,150,900	5,474,000	31,800	48,406,600
	WATER SUB-REGION I						
6	Upper Bluestone River	Va.	1,897,300	327,900	354,600	1,100	2,580,900
	Grand Total		37,647,200	7,478,800	5,828,600	32,900	50,987,500

1/ As of October 1967.
2/ The U. S. Forest Service will make a detailed study and appraisal to supplement the proposed project before authorization for detailed planning is initiated.

TABLE XXX - D

Upstream Watersheds - Other River Basin Studies - Susquehanna River Basin 1/

Water Sub-Region	Sub-Basin	Number of Watersheds	Number of Structures	Drainage Area Controlled	Sediment	Temporary Floodwater	Beneficial Use	Total 2/	Pool for Beneficial Use	Cost
		(No.)	(No.)	(Sq. Mi.)	(Ac. Ft.)	(Ac. Ft.)	(Ac. Ft.)	(Ac. Ft.)	(Acres)	($1,000)
A	I	-	2	2.7	17	432	1,728	2,177	146	269
	III	4	40	382.6	4,573	41,364	106,919	152,856	6,378	38,106
	VII	1	10	134.0	5,502	3,799	38,674	47,975	1,944	8,821
	VIII	-	4	50.1	932	1,985	36,400	39,317	1,610	12,951
	Total	5	56	569.4	11,024	47,580	183,721	242,325	10,078	60,147
B	I	13	90	819.1	5,458	68,426	241,041	314,925	13,451	76,692
	II	9	43	480.6	6,495	28,066	92,169	126,730	5,090	39,683
	III	11	62	538.2	6,904	49,075	158,658	214,637	8,763	57,959
	IV	1	12	117.2	1,621	13,165	34,509	49,295	1,743	13,328
	V	13	41	401.4	3,912	32,002	134,865	170,779	6,603	46,837
	VI	11	70	828.8	9,692	46,437	299,881	356,010	14,245	96,165
	VII	5	26	232.9	3,846	11,721	94,808	110,375	4,110	23,395
	Total	63	344	3,418.2	37,928	248,892	1,055,931	1,342,751	54,005	354,059
F	IV	7	59	831.7	5,995	77,062	183,775	266,832	7,492	102,593
	V	-	3	53.0	136	2,200	21,668	24,004	605	15,000
	Total	7	62	884.7	6,131	79,262	205,443	290,836	8,097	117,593
Grand Total		75	462	4,872.3	55,083	375,734	1,445,095	1,875,912	72,180	531,799

1/ As of January 1968.
2/ To the crest of emergency spillway.

TABLE XXX - E

Upstream Watersheds - Other River Basin Studies
Tombigbee River Basin 1/ - Water Sub-Region E

WATERSHED No.	WATERSHED Name	Watershed Area	No. of Structures	Drainage Area Controlled	Total Flood Prevention	Channel Improvement	Structural Costs	Average Annual Damages	AVERAGE ANNUAL BENEFITS: Damage Reduction	AVERAGE ANNUAL BENEFITS: More Intensive Land Use	AVERAGE ANNUAL BENEFITS: Changed Land Use	AVERAGE ANNUAL BENEFITS: Secondary	AVERAGE ANNUAL BENEFITS: Total	B/C Ratio 2/	Floodplain Area
		(Sq. Mi.)	(No.)	(Sq. Mi.)	(Inches)	(Miles)	($1,000)	(Dollars)	(Dollars)	(Dollars)	(Dollars)	(Dollars)	(Dollars)		(Acres)
M-2	Twenty-Mile Donovan Cr.	225.3	12	51.23	One inch sediment storage. Five inches floodwater storage.	61.3	3,854.2	427,364	233,000	57,302		30,968	321,270	3.2:1	31,728
M-4	McKay's Creek	146.0	15	48.30		53.5	2,792.3	111,603	77,490	27,935		18,302	123,727	1.5:1	15,885
M-7	Mantachie Creek	191.0	16	41.37		74.0	3,017.4	362,175	222,140	54,631		29,525	306,296	3.6:1	26,888
M-8	Reed Cummings	122.7	9	41.59		22.5	2,027.3	97,484	52,098	23,474		15,397	90,969	1.7:1	13,348
M-11	Tallabinnela Creek	88.4	6	9.88		32.5	1,220.6	194,511	49,832			4,982	54,814	2.6:1	12,447
M-12	Cowpenna Creek	64.8	7	14.30		26.0	1,029.8	122,843	82,021			8,202	90,223	3.2:1	9,121
M-14	Mattubby & James Cr.	194.0				45.3	1,633.1	227,140	90,156			9,016	99,172	3.2:1	27,323
M-15	Weanners & Stanefer Cr.	191.4	3	28.32		34.0	2,031.7	76,610	41,390	18,312		11,997	71,699	1.6:1	20,826
M-19	Hang Kettle & Town Cr.	88.1				24.3	696.8	159,940	40,866			4,087	44,953	7.1:1	12,408
M-20	McKinley's Creek	100.6	2	17.00		13.0	1,503.0	95,867	55,718			6,893	62,611	3.0:1	10,941
M-22	Trim Cane Creek	180.2	2	6.15		58.0	1,381.1	166,198	42,570			4,257	46,827	2.3:1	26,558
M-23	Spring & Town Creek	108.1				31.3	886.3	88,684	22,716			2,272	24,988	3.1:1	15,224
M-24	Stinson Creek	80.5				7.5	969.9	17,105	9,088			909	9,997	3.6:1	8,758
M-25	Catalpa Creek	130.7	7	12.10		62.0	1,618.2	236,700	60,629			6,063	66,692	2.4:1	18,410
M-26	Cypress & Talking Warrior	145.5	10	23.93		44.0	911.8	216,194	55,233			5,523	60,756	1.5:1	16,769
M-27	McCowers Creek	267.8				111.5	2,964.4	341,516	87,477			8,747	96,224	1.7:1	32,558
M-31	Browning & W. Water Cr.	163.9	8	24.73		66.0	2,073.7	243,382	62,181			6,218	68,399	1.3:1	18,878
A-25	Woolblank, Beaver & Blubber Creek	145.1	2	11.51		53.0	1,279.1	50,024	26,668			2,667	29,335	0.9:1	15,000
A-26	Lubbub Creek	291.2				100.5	2,641.8	116,092	61,888			6,188	68,076	0.9:1	29,824
A-27	New River & Barrow Cr.	257.7	18	55.51		48.5	3,006.5	47,100	33,234	81,900		27,791	142,925	1.9:1	28,035
A-13 & M-35	Scooba & Bodka Creek	264.5	5	5.90		59.3	2,026.0	116,803	41,590			4,195	46,145	1.2:1	32,168
A-15 & M-9	Bull Mountain Creek	366.9	24	132.03		101.5	8,054.2	291,503	158,771	70,191		45,988	274,950	1.1:1	39,915
A-18 & M-21	L. Buttahatchie River	191.2	16	33.65		37.5	2,184.6	151,894	82,728			8,273	91,001	1.5:1	20,798
A-20 & M-24B	Yellow Creek	360.1	14	205.76		77.0	5,342.9	146,520	78,120		26,136	31,515	135,771	0.8:1	37,440
A-23 & M-28	Ellis, Nash & Kincade Creek	159.0				48.0	1,206.7	127,112	67,763			6,776	74,539	3.7:1	12,336
A-23 & M-24c	Lower Luxapalila Cr.	125.4				39.0	976.6	108,504	57,604	6,647		8,059	72,310	4.4:1	13,645
A-14 & M-32 & M-34	Bogue Chitto and Woodward Creek	304.4				60.0	1,859.6	151,986	54,597			5,460	60,057	2.4:1	37,012
	Total	4,954.5	176	763.26		1,391.0	59,189.6	4,492,854	1,947,928	340,392	26,136	320,270	2,634,726		584,243

1/ As of June 1964.
2/ Feasible project if B/C ratio is 0.8:1 or greater.

TABLE XXXI

Agricultural Land Requirements to Meet Projected Production by Water Sub-Regions, 1980, 2000, and 2020 (1,000 acres)

Water Sub-Region	1980 Cropland	1980 Pasture	2000 Cropland	2000 Pasture	2020 Cropland	2020 Pasture
A	319	132	288	126	259	122
B	3,502	2,153	3,163	2,045	2,840	1,990
C	82	188	74	178	67	173
D	1,420	700	1,282	665	1,152	647
E	2,030	1,207	1,833	1,147	1,646	1,116
F	2,785	2,256	2,516	2,143	2,259	2,085
G	3,231	4,437	2,919	4,214	2,621	4,100
H	493	646	445	613	400	597
I	1,095	917	989	871	888	847
J	3,700	2,743	3,342	2,606	3,001	2,536
Total	18,657	15,379	16,851	14,608	15,133	14,213

Source: Unpublished Economic Research Service data.

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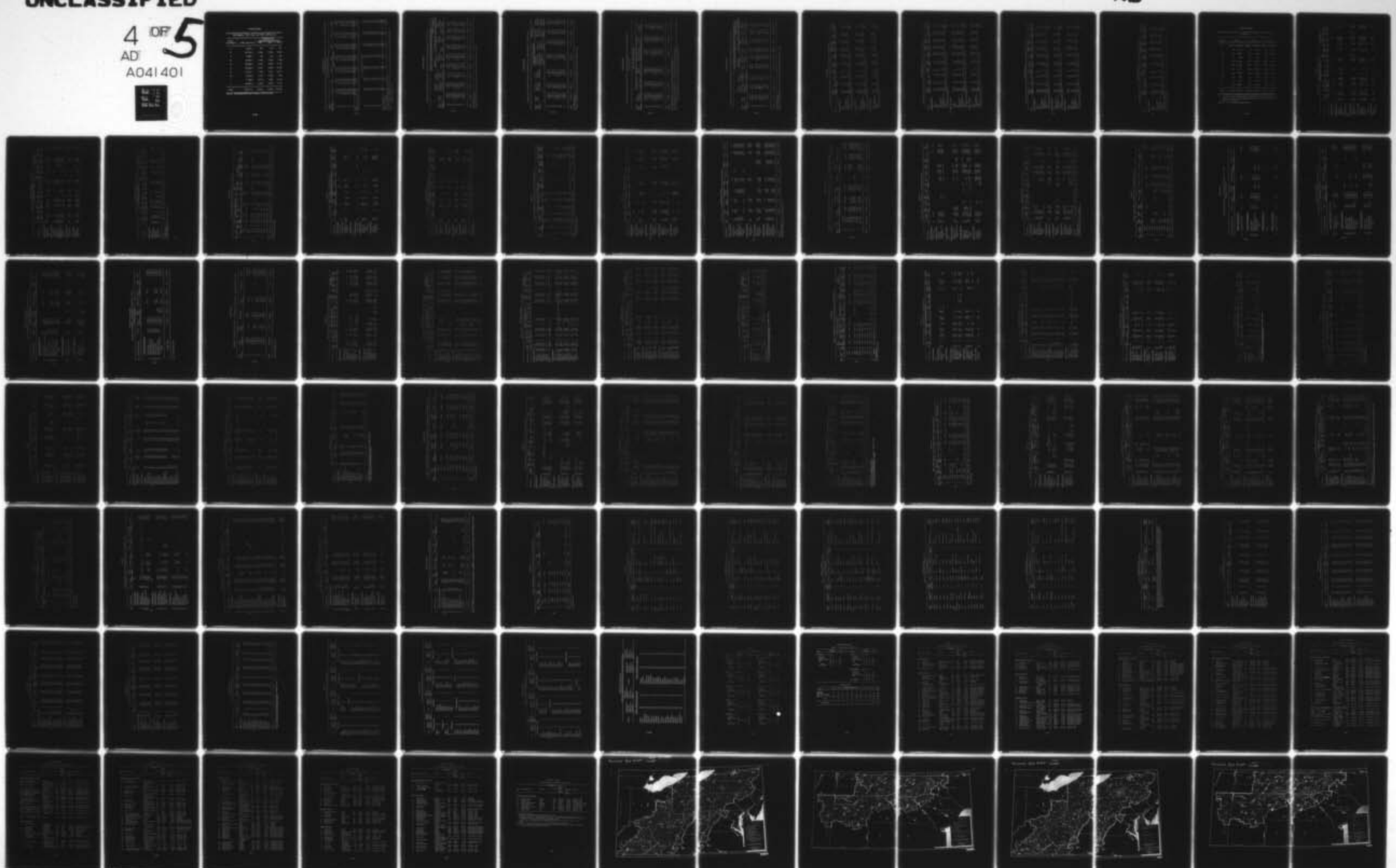

TABLE XX

Projected Land Availability for Agric
Sub-Regions, 1980, 2000, an

Water Sub-Region	Total Land Area	1
A	2, 837. 1	
B	18, 178. 8	5
C	1, 466. 3	
D	6, 827. 7	2
E	24, 388. 2	3
F	16, 368. 6	5
G	23, 951. 1	7
H	3, 419. 6	1
I	7, 166. 0	2
J	20, 508. 0	6
Total	125, 111. 4	34

Source: Unpublished Economic Resea

TABLE XXXIII

Number and Average Size of Farms by Water Sub-Regions, Selected Years, 1949-64, with Projections to 1970, 1980, and 2000

Water Sub-Region	1949	1954	1959	1964	1970	1980	2000
				Number of Farms			
A	9, 332	8, 499	6, 523	4, 783	3, 940	2, 790	1, 635
B	78, 628	68, 992	55, 591	43, 851	36, 145	25, 600	14, 985
C	3, 435	3, 173	2, 456	1, 956	1, 630	1, 150	675
D	72, 247	63, 155	41, 464	32, 065	26, 450	18, 735	10, 970
E	190, 033	157, 578	102, 539	83, 252	68, 635	48, 600	28, 450
F	86, 181	72, 659	52, 654	44, 338	36, 540	25, 875	15, 150
G	151, 266	131, 441	91, 333	75, 273	62, 050	43, 940	25, 725
H	30, 044	26, 767	19, 249	16, 015	13, 200	9, 350	5, 475
I	65, 983	57, 141	45, 392	39, 241	32, 350	22, 900	13, 410
J	176, 830	155, 046	115, 491	98, 062	80, 860	57, 260	33, 525
Total	863, 979	747, 451	532, 692	438, 836	361, 800	256, 200	150, 000
Percent of U. S. 1/	16. 0	15. 6	14. 4	13. 9	13. 4	12. 2	10. 0
				Average Farm Size (acres)			
A	96	104	118	132	153	174	221
B	137	147	170	193	222	253	321
C	169	175	196	233	266	304	385
D	66	69	84	92	106	120	153
E	85	95	113	127	147	167	212
F	98	106	124	134	154	176	223
G	95	100	122	133	153	174	221
H	78	80	100	111	128	145	184
I	71	77	91	100	115	131	166
J	68	72	86	92	106	121	154
Region Average	87	93	112	122	141	161	204
U. S. 1/ Average	215	242	302	351	420	490	680

1/ For the 48 conterminous states only.

Source: (1) 1949-64 data, U. S. Census of Agriculture; (2) Projections, unpublished Economic Research Service data.

TABLE XXXIV

Conservation Treatment Needs for Cropland by Water Sub-Regions 1/ (1,000 acres)

Water Sub-Region	Total Area	Needing Treatment and Feasible to Treat	Land With No Problems That Limit Use	Land on Which the Dominant Problem Is: Erosion – Total Area	Erosion – Area Needing Treatment	Excess Water – Total Area	Excess Water – Area Needing Treatment	Unfavorable Soil Conditions – Total Area	Unfavorable Soil Conditions – Area Needing Treatment
A	298.1	189.1	9.9	251.5	166.8	30.0	19.2	6.7	3.1
B	3,459.6	1,989.4	415.7	2,380.5	1,600.7	494.4	307.5	169.0	81.2
C	80.4	48.9	3.7	52.4	33.8	13.8	9.2	10.5	5.9
D	1,353.0	889.6	11.9	1,171.7	767.3	166.5	120.5	2.9	1.8
E	3,275.6	2,124.1	125.3	2,011.7	1,376.0	901.8	591.5	236.8	156.6
F	2,604.0	1,740.2	106.8	1,945.3	1,370.8	520.4	351.5	31.5	17.9
G	3,150.2	1,847.1	174.9	2,057.3	1,277.8	816.8	509.4	101.2	59.9
H	525.8	325.6	55.2	321.7	231.8	66.5	43.6	82.4	50.2
I	1,160.0	738.8	97.1	922.5	647.4	93.2	61.3	47.2	30.1
J	3,620.8	2,238.9	181.7	2,771.8	1,796.4	489.3	337.9	178.0	104.6
Total	19,527.5	12,131.7	1,182.2	13,886.4	9,268.8	3,592.7	2,351.6	866.2	511.3

1/ 1975 acreage.
Source: National Inventory of Soil and Water Conservation Needs, 1958.

TABLE XXXV

Conservation Treatment Needs for Pasture by Water Sub-Regions 1/ (1,000 acres)

Water Sub-Region	Total Area	Area Not Needing Treatment	Area Needing Treatment	TYPE OF TREATMENT: Establishment or Re-establishment of Vegetative Cover	Improvement of Vegetative Cover	Protection from Over-grazing Erosion Encroachment of Plants	Water Management Excess Water
A	120.2	34.8	85.4	20.2	63.8	2.2	35.4
B	1,989.2	832.7	1,156.5	385.2	636.8	294.4	160.1
C	168.0	73.9	94.1	29.3	61.1	34.2	14.2
D	743.0	188.1	554.9	331.4	133.6	168.9	40.1
E	2,821.4	674.3	2,147.1	1,215.5	694.2	700.2	165.7
F	1,893.0	621.8	1,271.2	394.7	751.7	200.3	208.0
G	3,668.2	1,219.3	2,448.9	721.4	1,474.0	553.6	191.4
H	611.3	136.7	474.6	146.8	278.7	89.4	21.4
I	1,080.6	291.8	788.8	409.6	307.0	206.9	35.2
J	2,940.4	802.5	2,137.9	1,201.7	733.0	637.5	108.6
Total	16,035.3	4,875.9	11,159.4	4,855.8	5,133.9	2,887.6	980.1

1/ 1975 acreage.
Source: National Inventory of Soil and Water Conservation Needs, 1958.

TABLE XXXVI

Conservation Treatment Needs for Forest and Woodland by Water Sub-Regions 1/
(1,000 acres)

Water Sub-Region	Area Needing Treatment	TYPE OF TREATMENT 2/ Establishment of Timber Stands	Hydrologic Stand Improvement	Protection from Overcutting and Damaging Logging	Protection from Grazing	Erosion Control
A	1,879.4	80.0	1,288.0	370.8	136.6	4.0
B	11,005.6	543.2	5,432.0	3,911.0	1,086.4	33.0
C	417.2	19.8	158.2	----	237.3	1.9
D	2,739.8	797.2	906.5	591.2	315.3	129.6
E	13,649.7	4,549.9	4,549.9	2,112.4	1,625.0	812.5
F	9,247.3	911.0	4,232.7	3,692.4	360.2	51.0
G	14,052.8	1,210.5	6,986.5	3,974.3	1,548.4	333.1
H	1,402.0	318.7	297.4	127.4	552.3	106.2
I	3,389.6	535.2	1,159.6	579.8	936.6	178.4
J	6,977.1	1,422.6	2,715.3	1,131.4	1,583.9	123.9
Total	64,760.5	10,388.1	27,726.1	16,490.7	8,382.0	1,773.6

1/ 1975 acreage. Does not include National Forest acreage.
2/ Different types of treatment are often required on the same acreage.
Source: National Inventory of Soil and Water Conservation Needs 1958, and Summary of Forest Hydrologic Condition plots taken on PL-566 watersheds in Appalachia.

TABLE XXXVII

Conservation Treatment Needs for Other Land by Water Sub-Regions 1/ (1,000 acres)

Water Sub-Region	Total Area	Needing Treatment and Feasible to Treat	Land With No Problems That Limit Use	LAND ON WHICH THE DOMINANT PROBLEM IS: EROSION Total Area	EROSION Area Needing Treatment	EXCESS WATER Total Area	EXCESS WATER Area Needing Treatment	UNFAVORABLE SOIL CONDITIONS Total Area	UNFAVORABLE SOIL CONDITIONS Area Needing Treatment
A	160.8	15.7	2.5	121.6	13.6	16.6	0.9	20.1	1.2
B	1,046.9	192.8	53.0	681.0	156.6	197.1	25.3	115.8	10.9
C	18.2	-----	18.2	-----	-----	-----	-----	-----	-----
D	339.7	118.6	2.1	304.4	106.7	26.2	10.4	7.0	1.5
E	557.1	216.0	9.1	427.9	166.9	55.6	23.2	64.5	25.9
F	1,426.3	288.6	83.8	974.7	251.2	299.8	30.2	68.0	7.2
G	1,097.2	307.9	202.7	718.1	240.5	98.8	33.7	77.6	33.7
H	79.0	19.0	1.5	58.6	13.8	3.9	0.7	15.0	4.5
I	209.9	51.9	1.2	154.9	39.9	10.5	3.1	43.3	8.9
J	798.6	214.7	49.2	512.6	150.6	50.5	15.8	186.3	48.3
Total	5,733.7	1,425.2	423.3	3,953.8	1,139.8	759.0	143.3	597.6	142.1

1/ 1975 acreage.

Source: National Inventory of Soil and Water Conservation Needs, 1958.

TABLE XXXVIII

Land Drainage Needs and Agricultural Yield Increases from Drainage and Associated Management by Water Sub-Regions

Land Use	Land Needing Treatment Drainage (Acres)	Per Cent of Total (Per Cent)	Unit of Yield	Average Increase Per Acre	Weighted Normalized Price (Dollars)	Gross Increase Per Acre (Dollars)	Weighted Harvest Cost Per Unit (Dollars)	Added Harvest Cost Per Acre (Dollars)	Net Increase Per Acre (Dollars)	Net Increase Per Composite Acre (Dollars)
WATER SUB-REGION A										
Corn	2,700	16.5	Bu.	31	1.25	38.75	0.211	6.54	32.21	5.31
Wheat	1,000	6.4	Bu.	16	1.60	25.60	0.370	5.92	19.68	1.26
Oats	1,800	11.3	Bu.	30	0.75	22.50	0.235	7.05	15.45	1.75
Clover Timothy Hay	6,600	40.8	Ton	1.1	27.50 1/	30.25	13.97	15.37	14.88	6.07
Small Grain Hay	200	1.5	Ton	1.1	27.50	30.25	13.97	15.37	14.88	0.22
Alfalfa and Alfalfa Mixtures	2,600	16.3	Ton	2.2	27.50	60.50	11.00	24.20	36.30	5.92
All Other Hay	1,200	7.2	Ton	1.4	27.50	38.50	13.97	19.56	18.94	1.36
Total	16,100	100.0								21.89
Less drainage cost per acre (average annual amortized cost including outlets, weighted by states and LRA's)										7.39
Net increase per acre after project costs										14.50
WATER SUB-REGION B										
Corn	54,500	18.8	Bu.	37	1.25	46.25	0.194	7.18	39.07	7.35
Wheat	21,500	7.4	Bu.	17	1.65	28.05	0.329	5.59	22.46	1.66
Oats	45,400	15.6	Bu.	28	0.75	21.00	0.224	6.27	14.73	2.30
Clover Timothy Hay	103,200	35.7	Ton	1.2	25.42 1/	30.50	13.75	16.50	14.00	5.00
Small Grain Hay	2,000	0.7	Ton	1.2	25.42	30.50	13.75	16.50	14.00	0.10
Alfalfa and Alfalfa Mixtures	46,800	16.1	Ton	1.6	25.42	40.67	11.00	17.60	23.07	3.71
All Other Hay	16,600	5.7	Ton	1.2	25.42	30.50	13.75	16.50	14.00	0.80
Total	289,900	100.0								20.92
Less drainage cost per acre (average annual amortized cost including outlets, weighted by states and LRA's)										9.26
Net increase per acre after project costs										11.66
WATER SUB-REGION C										
Corn	1,700	16.5	Bu.	35	1.25	43.75	0.187	6.55	37.20	6.14
Clover Timothy Hay	2,900	29.9	Ton	1.0	32.00 1/	32.00	13.97	13.97	18.03	5.39
Alfalfa and Alfalfa Mixtures	1,600	24.3	Ton	1.2	32.00	38.40	10.54	12.65	25.75	6.26
All Other Hay	2,600	29.3	Ton	1.0	32.00	32.00	7.00	7.00	25.00	7.33
Total	8,800	100.0								25.12
Less drainage cost per acre (average annual amortized cost including outlets, weighted by states and LRA's)										9.16
Net increase per acre after project costs										15.96

TABLE XXXVIII (continued)

Land Drainage Needs and Agricultural Yield Increases from Drainage and Associated *Management* by Water Sub-Regions

Land Use	Land Needing Treatment Drainage (Acres)	Per Cent of Total (Per Cent)	Unit of Yield	Average Increase Per Acre	Weighted Normalized Price (Dollars)	Gross Increase Per Acre (Dollars)	Weighted Harvest Cost Per Unit (Dollars)	Added Harvest Cost Per Acre (Dollars)	Net Increase Per Acre (Dollars)	Net Increase Per Composite Acre (Dollars)
WATER SUB-REGION D										
Corn	33,200	26.9	Bu.	24	1.21	29.04	0.190	4.56	24.48	6.59
Soy Beans	3,600	2.9	Bu.	14	2.21	30.94	0.352	4.93	26.01	0.75
Cotton	15,000	12.2	Lbs.	118	0.33	38.94	0.110	12.98	25.96	3.17
Wheat	19,000	15.4	Bu.	10	1.70	17.00	0.281	2.81	14.19	2.19
Oats	15,500	12.6	Bu.	12	0.75	9.00	0.223	2.68	6.32	0.80
Clover Timothy Hay	7,800	6.3	Ton	1.0	31.03 1/	31.03	12.16	12.16	18.87	1.19
Lespedeza Hay	13,400	10.9	Ton	1.0	31.03	31.03	9.23	9.23	21.80	2.38
Small Grain Hay	7,300	5.9	Ton	0.5	31.03	15.52	12.16	6.08	9.44	0.56
Alfalfa and Alfalfa Mixtures	4,400	3.6	Ton	0.8	31.03	24.82	19.79	15.83	8.99	0.32
All Other Hay	4,100	3.3	Ton	1.0	31.03	31.03	12.16	12.16	18.87	0.62
Total	123,300	100.0								18.57
Less drainage cost per acre (average annual amortized cost including outlets, weighted by states and LRA's)										9.76
Net increase per acre after project cost										8.81
WATER SUB-REGION E										
Corn	431,400	56.7	Bu.	22	1.17	25.74	0.187	4.11	21.63	12.26
Soy Beans	14,500	1.9	Bu.	12	2.20	26.40	0.376	4.51	21.89	0.42
Cotton	171,200	22.5	Lbs.	115	0.33	37.95	0.108	12.42	25.53	5.74
Wheat	14,500	1.9	Bu.	9	1.70	15.30	0.334	3.01	12.29	0.23
Oats	22,000	2.9	Bu.	12	0.80	9.60	0.267	3.20	6.40	0.19
Clover Timothy Hay	5,300	0.7	Ton	1.0	27.00 1/	27.00	12.16	12.16	14.84	0.10
Small Grain Hay	16,800	2.2	Ton	0.5	27.00	13.50	12.16	6.08	7.42	0.16
Lespedeza Hay	32,700	4.3	Ton	1.0	27.00	27.00	10.59	10.59	16.41	0.71
Alfalfa and Alfalfa Mixtures	9,100	1.2	Ton	0.9	27.00	24.30	14.23	12.81	11.49	0.14
All Other Hay	43,400	5.7	Ton	1.0	27.00	27.00	12.16	12.16	14.84	0.85
Total	760,900	100.0								20.80
Less drain age cost per acre (average annual amortized cost including outlets, weighted by states and LRA's)										8.50
Net increase per acre after project costs										12.30
WATER SUB-REGION F										
Corn	65,200	16.5	Bu.	35	1.25	43.75	0.201	7.04	36.71	6.06
Wheat	22,300	5.6	Bu.	17	1.63	27.71	0.372	6.32	21.39	1.20
Oats	65,400	16.6	Bu.	28	0.75	21.00	0.218	6.10	14.90	2.47
Clover Timothy Hay	148,500	37.5	Ton	1.2	26.33 1/	31.60	13.17	15.80	15.80	5.93
Alfalfa and Alfalfa Mixtures	73,000	18.5	Ton	1.6	26.33	42.13	10.78	17.25	24.88	4.60
All Other Hay	21,100	5.3	Ton	1.2	26.33	31.60	13.17	15.80	15.80	0.84
Total	395,500	100.0								21.10
Less drainage cost per acre (average annual amortized cost including outlets, weighted by states and LRA's)										8.70
Net increase per acre after project cost										12.40

TABLE XXXVIII (continued)
Land Drainage Needs and Agricultural Yield Increases from Drainage and Associated Managem ent by Water Sub-Regions

Land Use	:Land :Needing :Treatment :Drainage	:Per Cent :of Total	:Unit of :Yield	:Average :Increase :Per Acre	:Weighted :Normalized :Price	:Gross :Increase :Per Acre	:Weighted :Harvest :Cost Per :Unit	:Added :Harvest :Cost Per :Acre	:Net :Increase :Per Acre	:Net Increase :Per Composite :Acre
	(Acres)	(Per Cent)			(Dollars)	(Dollars)	(Dollars)	(Dollars)	(Dollars)	(Dollars)
WATER SUB-REGION G										
Corn	171, 900	32. 3	Bu.	30	1. 07	32. 10	0. 199	5. 97	26. 13	8. 44
Soy Beans	13, 800	2. 6	Bu.	8	2. 25	18. 00	0. 431	3. 45	14. 55	0. 38
Wheat	40, 500	7. 6	Bu.	10	1. 66	16. 60	0. 337	3. 37	13. 23	1. 01
Oats	28, 800	5. 4	Bu.	25	0. 68	17. 00	0. 244	6. 10	10. 90	0. 59
Clover Timothy Hay	161, 800	30. 4	Ton	1. 0	24. 12 1/	24. 12	12. 01	12. 01	12. 11	3. 68
Small Grain Hay	8, 500	1. 6	Ton	1. 0	24. 12	24. 12	12. 95	12. 95	11. 17	0. 18
Lespedeza Hay	6, 400	1. 2	Ton	0. 6	24. 12	14. 47	8. 64	5. 18	9. 29	0. 11
Alfalfa and Alfalfa Mixtures	68, 100	12. 8	Ton	1. 0	24. 12	24. 12	10. 86	10. 86	13. 26	1. 70
All Other Hay	31, 600	6. 1	Ton	1. 0	24. 12	24. 12	12. 95	12. 95	11. 17	0. 68
Total	532, 300	100. 0								16. 77
Less drainage cost per acre (average annual amortized cost including outlets, weighted by states and LRA's)										8. 55
Net increase per acre after project cost										8. 22
WATER SUB-REGION H										
Corn	17, 500	45. 5	Bu.	26	1. 10	28. 60	0. 161	4. 19	24. 41	11. 11
Clover Timothy Hay	7, 100	18. 5	Ton	0. 6	24. 00 1/	14. 40	14. 00	8. 40	6. 00	1. 11
Lespedeza Hay	6, 100	15. 9	Ton	0. 5	24. 00	12. 00	11. 16	5. 58	6. 42	1. 02
Alfalfa and Alfalfa Mixtures	4, 000	10. 0	Ton	0. 7	24. 00	16. 80	9. 49	6. 64	10. 16	1. 02
All Other Hay	3, 900	10. 1	Ton	0. 6	24. 00	14. 40	14. 00	8. 40	6. 00	0. 61
Total	38, 600	100. 0								14. 87
Less drainage cost per acre (average annual amortized cost including outlets, weighted by states and LRA's)										8. 52
Net increase per acre after project cost										6. 35
WATER SUB-REGION I										
Corn	26, 000	44. 5	Bu.	25	1. 11	27. 75	0. 172	4. 30	23. 45	10. 44
Soy Beans	1, 400	2. 3	Bu.	8	2. 20	17. 60	0. 444	3. 55	14. 05	0. 32
Wheat	1, 100	2. 0	Bu.	10	1. 65	16. 50	0. 340	3. 40	13. 10	0. 26
Oats	900	1. 6	Bu.	16	0. 76	12. 16	0. 283	4. 53	7. 63	0. 12
Clover Timothy Hay	6, 000	10. 3	Ton	0. 6	24. 44 1/	14. 66	7. 00	4. 20	10. 46	1. 08
Small Grain Hay	2, 200	3. 7	Ton	0. 5	24. 44	12. 22	7. 00	3. 50	8. 72	0. 32
Lespedeza Hay	15, 600	26. 7	Ton	0. 6	24. 44	14. 66	7. 75	4. 65	10. 01	2. 67
Alfalfa and Alfalfa Mixtures	2, 400	4. 2	Ton	0. 7	24. 44	17. 11	9. 23	6. 46	10. 65	0. 45
All Other Hay	2, 700	4. 7	Ton	0. 6	24. 44	14. 66	7. 00	4. 20	10. 46	0. 49
Total	58, 300	100. 0								16. 15
Less drainage cost per acre (average annual amortized cost including outlets, weighted by states and LRA's)										8. 28
Net increase per acre after project cost										7. 87

TABLE XXXVIII (continued)

Land Drainage Needs and Agricultural Yield Increases from Drainage and Associated Management by Water Sub-Regions

Land Use	Land Needing Treatment Drainage	Per Cent of Total	Unit of Yield	Average Increase Per Acre	Weighted Normalized Price	Gross Increase Per Acre	Weighted Harvest Cost Per Unit	Added Harvest Cost Per Acre	Net Increase Per Acre	Net Increase Per Composite Acre
	(Acres)	(Per Cent)			(Dollars)	(Dollars)	(Dollars)	(Dollars)	(Dollars)	(Dollars)
WATER SUB-REGION J										
Corn	115,700	37.0	Bu.	24	1.16	27.84	0.181	4.34	23.50	8.70
Soy Beans	10,300	3.3	Bu.	8	2.20	17.60	0.382	3.06	14.54	0.48
Cotton	38,800	12.4	Lbs.	118	0.33	38.94	0.108	12.74	26.20	3.25
Wheat	13,500	4.3	Bu.	10	1.68	16.80	0.297	2.97	13.83	0.59
Oats	12,800	4.1	Bu.	16	0.79	12.64	0.272	4.35	8.29	0.34
Clover Timothy Hay	34,100	10.9	Ton	0.8	27.48 1/	21.98	7.98	6.38	15.60	1.70
Small Grain Hay	11,900	3.8	Ton	0.7	27.48	19.24	7.98	5.59	13.65	0.52
Lespedeza Hay	32,500	10.4	Ton	0.6	27.48	16.49	9.84	5.90	10.59	1.10
Alfalfa and Alfalfa Mixtures	23,800	7.6	Ton	0.7	27.48	19.24	12.94	9.06	10.18	0.77
All Other Hay	19,400	6.2	Ton	0.7	27.48	19.24	7.98	5.59	13.65	0.85
Total	312,700	100.0								18.30
Less drainage cost per acre (average annual amortized cost including outlets, weighted by states and LRA's)										7.50
Net increase per acre after project cost										10.80

1/ All hay price used for each type hay.

TABLE XXXIX

Irrigated Land in Farms, by Water Sub-Regions, Selected Years, 1954-64 1/

Water Sub-Region	1954 Farms Reporting		1959 Farms Reporting		1964 Farms Reporting	
	(No.)	(Acres)	(No.)	(Acres)	(No.)	(Acres)
A	56	1,731	52	1,405	85	2,050
B	301	7,065	298	7,462	418	12,567
C	16	608	20	637	17	381
D	556	10,678	886	11,703	1,385	9,581
E	370	9,174	200	5,751	1,127	17,384
F	210	3,321	223	3,747	204	3,877
G	202	3,434	166	2,963	197	3,424
H	54	516	73	496	147	750
I	69	607	115	1,005	117	627
J	903	15,762	753	11,484	916	10,245
Total	2,635	50,151	2,704	45,431	4,513	59,224

1/ The Region's irrigated acreage is expected to trend gradually upward in future years, but no projections were made due to the strong influence of rainfall fluctuations from year to year that cannot be forecast.

Source: U. S. Census of Agriculture.

TABLE XL - A

Upstream Watersheds - Investigated or Planned 1/ - -Structural Measures

Watershed Name	State	Water-shed Area	No. of Struc-tures	Drain-age Area Con-trolled	STORAGE VOLUME BY PURPOSE: Flood Preven-tion	M & I Water Supply	Recrea-tion	Irriga-tion	Total 2/	Addi-tional Storage Benefi-cial Uses	Channel Improve-ment	ESTIMATED INSTALLATION COST: Land Treat-ment	Identi-fied Needs	Full Develop-ment	Flood-plain Area
		(Sq. Mi.)	(No.)	(Sq. Mi.)	(AF.)	(AF)	(AF)	(AF)	(AF)	(AF)	(Miles)	($1,000)	($1,000)	($1,000)	(Acres)
WATER SUB-REGION A															
Nescopeck Creek	Pa.	76.50	1	33.2	5,757		5,483		11,240				1,510.0		
WATER SUB-REGION B															
Marsh Ditch	N. Y.	22.75									4.7	129.6	450.5		307
New Berlin	N. Y.	4.69	2	3.45	403		530		933				415.0		
Newton-Hoffman Cr.	N. Y.	85.31	7	38.72	8,438	150	1,315		9,903		3.3	452.1	4,455.7		540
Bentley Creek	Pa.	57.40	7	22.13	4,189		867		5,056		1.33		2,043.8		
Total		170.15	16	64.30	13,030	150	2,712		15,892		9.33	581.7	7,365.0		847
WATER SUB-REGION C															
None															
WATER SUB-REGION D															
Camp-Cane Creek	N. C.	43.52	5	12.0	2,485		380		2,865	6,550	20.3		1,168.3	2,572.8	1,220
Turner Creek	N. C.	10.78	3	5.65	895				895		5.37	80.1	183.7		359
Little Beaver Dam Cr.	S. C.	37.92	4	16.43	5,361				5,361		12.0	581.1	773.5		1,629
Total		92.22	12	34.08	8,741		380		9,121	6,550	37.67	661.2	2,125.5	2,572.8	3,208
WATER SUB-REGION E															
Cahulga Creek	Ala.	18.96	1	6.54	2,399	637			3,036		1.8	102.8	416.4		378
Hudson River	Ga.	197.67	17	107.37	26,647			66	26,713		51.5	1,710.0	3,852.2		9,782
Suwanee Creek	Ga.	52.54	3	16.59	4,384				4,384		13.6	371.0	1,486.5		2,536
Tesnatee Creek	Ga.	70.62	7	23.59	7,332	49	475		7,856		11.4	313.6	1,337.5		2,750
Brown Creek	Miss.	147.34	8	65.1	22,065				22,065		53.3		2,756.5		20,225
Line Creek	Miss.	199.0	16		*		*				61.5		4,930.4		22,925
Total		686.13	52	160.60	62,827	686	475	66	64,054		193.1	2,497.4	14,779.5		58,596
* Potential for															
WATER SUB-REGION F															
Short Creek	Ohio	127.00	6	33.7	6,555		*		6,555		6.5	249.9	3,135.4		2,900
Jacobs Creek	Pa.	97.66	3	39.14	6,589		1,613		8,202		3.64	778.7	3,823.4		314
* Potential for															

TABLE XL - A (continued)
Upstream Watersheds - Investigated or Planned 1/ - Structural Measures

Watershed Name	State	Watershed Area	No. of Structures	Drainage Area Controlled	STORAGE VOLUME BY PURPOSE: Flood Prevention	M & I Water Supply	Recreation	Irrigation	Total 2/	Additional Storage Beneficial Uses	Channel Improvement	ESTIMATED INSTALLATION COST: Land Treatment	Identified Needs	Full Development	Floodplain Area
		(Sq. Mi.)	(No.)	(Sq. Mi.)	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	(Miles)	($1,000)	($1,000)	($1,000)	(Acres)
WATER SUB-REGION F (continued)															
Stonecoal Creek	W. Va.	40.03	1	16.80	3,963		963		4,926				604.7		225
Ten Mile Creek	W. Va.	15.16	5	10.30	2,436	42	644		3,122				2,089.0		90
Total		279.85	15	99.94	19,543	42	3,220		22,805		10.14	1,028.6	9,652.5		3,529
WATER SUB-REGION G															
Grassy Creek	Ky.	52.34	1	5.42	975		980		1,955		6.5		455.6		600
Little Fork of Little Sandy River	Ky.	130.00	10	70.87	14,600				14,600				2,759.2		3,320
Pine Creek	Ohio	184.70	9	61.75	12,240				12,240		20.2	768.3	1,640.6		5,748
Elk-Two Mile Creek	W. Va.	13.20	6	6.43	1,425				1,425			41.0	2,092.1		135
Fourpole Creek	W. Va.	14.63	3	7.02	1,536		147		1,683			73.8	1,392.5		
Kanawha Two-Mile Creek	W. Va.	24.02	4	6.61	1,463		665		2,128			110.6	1,785.9		136
Rocky Fork	W. Va.	19.03									3.45		378.8		154
Slack Branch	W. Va.	7.97	3	5.40	1,261	26	1.319		2,606				1,289.0		
Total		445.89	36	163.50	33,500	26	3,111		36,637		30.15	993.7	11,793.7		10,093
WATER SUB-REGION H															
Redlick Creek	Ky.	69.84	5	21.86	4,802	400	458		5,660		5.0		971.0		2,520
U. Howard Creek	Ky.	26.05	1	13.50	3,065		505		3,570				423.5		360
Total		95.89	6	35.36	7,867	400	963		9,230		5.0		1,394.5		2,880
WATER SUB-REGION I															
Marsh Creek	Ky.	35.91	2	6.22	1,014				1,014		8.04	216.6	715.3		948
Roaring River	Tenn.	303.44	3	34.00	13,171	8,160	1,924		23,255				2,500.0		
Smith Fork Creek	Tenn.	240.23	6	78.20	36,840	300			37,140		71.97		5,205.3		4,650
Total		579.58	11	118.42	51,025	8,460	1,924		61,409		80.01	216.6	8,420.6		5,598

TABLE XL - A (continued)
Upstream Watersheds - Investigated or Planned 1/ - Structural Measures

Watershed Name	State	Watershed Area	No. of Structures	Drainage Area Controlled	STORAGE VOLUME BY PURPOSE: Flood Prevention	M & I Water Supply	Recreation	Irrigation	Total 2/	Additional Storage Beneficial Uses	Channel Improvement	ESTIMATED INSTALLATION COST: Land Treatment	Identified Needs	Full Development	Floodplain Area
		(Sq. Mi.)	(No.)	(Sq. Mi.)	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	(Miles)	($1,000)	($1,000)	($1,000)	(Acres)
WATER SUB-REGION J															
Cane Creek	N. C.	30.16	6	16.80	3,050		2,326		5,376				2,382.0		500
Fr. Broad River 3/	N. C.	339.36	17	145.62	38,376				38,376		5.3	1,312.1	5,159.3		14,192
Boiling Fork Creek	Tenn.	101.88									47.26	638.3	614.3		2,700
Hickory Creek	Tenn.	126.56	5	33.60	11,050				11,050		27.65		1,836.5		4,500
Horse Creek	Tenn.	46.09	4	15.15	3,199		540		3,739		22.03		1,786.1		
Sweetwater Creek	Tenn.	58.81	6	18.30	4,975	704	1,120		6,799		41.29		1,712.7		
Upper Clinch Valley	Va.	57.57	4	9.56	1,930	950			2,880		8.42	307.8	1,551.0		361
Total		760.43	42	129.03	62,580	1,654	3,986		68,220		151.95	2,258.2	15,041.9		22,253
Grand Total		3,186.64	191	948.43	264,870	11,418	22,254	66	298,608	6,550	517.35	8,237.4	72,083.2	2,572.8	107,004

1/ As of October 1967.
2/ Emergency spillway crest.
3/ Included in comprehensive basin-wide study planned by TVA.

TABLE XL-A(1)

Summary - Upstream Watersheds - Investigated or Planned - Structural Measures

Sub-Region	Project Area	No. of Structures	Drainage Area Controlled	STORAGE VOLUME BY PURPOSE Floodwater	M & I Water Supply	Recreation	Irrigation	Total 1/	Additional Storage Beneficial Uses	Channel Improvement	Estimated Installation Cost Land Treatment	Estimated Installation Cost Structural Measures	Full Development	Floodplain Area
	(Sq.Mi.)	(No.)	(Sq.Mi.)	(Ac.Ft.)	(Ac.Ft.)	(Ac.Ft.)	(Ac.Ft.)	(Ac.Ft.)	(Ac.Ft.)	(Miles)	($1,000)	($1,000)	($1,000)	(Acres)
A	76.50	1	33.2	5,757		5,483		11,240				1,510.0		
B	170.15	16	64.3	13,030	150	2,712		15,892		9.33	581.7	7,365.0		847
C	None													
D	92.22	12	34.08	8,741		380		9,121	6,550	37.67	661.2	2,125.5	2,572.8	3,208
E	686.13	52	160.6	62,827	686	475	66	64,054		193.1	2,497.4	14,799.5		58,596
F	279.85	15	99.94	19,543	42	3,220		22,805		10.14	1,028.6	9,652.5		3,529
G	445.89	36	163.50	33,500	26	3,111		36,637		30.15	993.7	11,793.7		10,093
H	95.89	6	35.36	7,867	400	963		9,230		5.0		1,394.5		2,880
I	579.58	11	118.42	51,025	8,460	1,924		61,409		80.01	216.6	8,420.6		5,598
J	760.43	42	239.03	62,580	1,654	3,986		68,220		151.95	2,258.2	15,041.9		22,253
Total	3,186.64	191	948.43	264,870	11,418	22,254	66	298,608	6,550	517.35	8,237.4	72,083.2	2,572.8	107,004

1/ To crest of emergency spillway.

TABLE XL -B

Upstream Watersheds - Investigated or Planned 1/ - Multi-Purpose Structures

Watershed Name	State	Number of Structures	STORAGE VOLUME AND SURFACE AREA BY PURPOSE: Flood Prevention		M & I Water Supply	Recreation		Irrigation	Additional Beneficial Storage	Estimated Recreation Days Provide	Population Served by Water Supply
		(No.)	(Ac. Ft.)	(Acres)	(Ac. Ft.)	(Ac. Ft.)	(Acres)	(Ac. Ft.)	(Ac. Ft.)		
WATER SUB-REGION A											
Nescopeck Creek	Pa.	1	5,757			5,483	400				
WATER SUB-REGION B											
New Berlin	N. Y.	1	185			530	30			8,200	
Newtown-Hoffman Creek	N. Y.	2	1,192	154	150	1,315	100			42,000	
Bentley Creek	Pa.	1	953	116		867					
Total		4	2,330	270	150	2,712	130			50,200	
WATER SUB-REGION C											
None											
WATER SUB-REGION D											
Camp-Cane Creek	N. C.	1	670	165		380	50		2,500	29,000	
WATER SUB-REGION E											
Cahulga Creek	Ala.	1	2,288	177	637						2,400
Hudson River	Ga.	1	1,968	133				66			
Tesnatee Creek	Ga.	2	7,332	509	49	475	40			36,700	
Line Creek	Miss.	2	*			*					1,500
Total		6	11,588	819	686	475	40	66		36,700	3,900
* Potential for											
WATER SUB-REGION F											
Short Creek	Ohio	1					185			98,200	
Jacobs Creek	Pa.	2	1,413	208		1,613	125			84,000	
Stonecoal Creek	W. Va.	1	3,963	206		963	100			28,000	
Ten Mile Creek	W. Va.	2	712	81	42	644	50			33,000	525
Total		6	6,088	495	42	3,220	460			243,200	525

TABLE XL -B (continued)

Upstream Watersheds - Investigated or Planned 1/ - Multi-Purpose Structures

Watershed Name	State	Number of Structures	STORAGE VOLUME AND SURFACE AREA BY PURPOSE: Flood Prevention		M & I Water Supply	Recreation		Irrigation	Additional Beneficial Storage	Estimated Recreation Days Provided	Population Served by Water Supply
		(No.)	(Ac. Ft.)	(Acres)	(Ac. Ft.)	(Ac. Ft.)	(Acres)	(Ac. Ft.)	(Ac. Ft.)		
WATER SUB-REGION G											
Grassy Creek	Ky.	1	975	197		980	102			20,900	
Fourpole Creek	W. Va.	1	1,205	85		147	36			47,520	
Kanawha-Two Mile Cr.	W. Va.	1	1,019	89		665	50			86,000	
Slack Branch	W. Va.	2	799	65	26	1,319	50			30,000	
Total		5	3,998	436	26	3,111	238			184,420	
WATER SUB-REGION H											
Redlick Creek	Ky.	2	2,187	201	400	458	87			20,000	2,500
Upper Howard Creek	Ky.	1	3,065	230		505	90			20,000	
Total		3	5,252	431	400	963	177			40,000	2,500
WATER SUB-REGION I											
Roaring River	Tenn.	3	13,171	1,118	8,160	1,924	900			40,000	14,200
Smith Fork Creek	Tenn.	1	5,350	280	300						1,000
Total		4	18,521	1,398	8,460	1,924	900			40,000	15,200
WATER SUB-REGION J											
Cane Creek	N. C.	1	1,768	88		2,326	50			29,000	
Horse Creek	Tenn.	1	540	67		540	40			31,000	
Sweetwater Creek	Tenn.	2	1,880	277	704	1,120	30			10,900	4,145
Upper Clinch Valley	Va.	2	1,180	108	950						3,000
Total		6	5,368	540	1,654	3,986	120			70,900	7,145
Grand Total		36	59,572	4,554	11,418	22,254	2,515	66	2,500	694,420	29,270

1/ As of October 1967.
2/ Emergency spillway crest.

TABLE XL-B(1)

Summary - Upstream Watersheds - Investigated or Planned - Multiple-Purpose Structures

Sub-Region	Number of Structures	STORAGE VOLUME AND SURFACE AREA BY PURPOSE: Flood Prevention		M & I Water Supply	Recreation		Fish and Wildlife	Irrigation	Water Quality	Additional Beneficial Storage	Estimated Recreation Days Provided	Population Served by Water Supply
	(No.)	(Ac.Ft.)	(Acres) 1/	(Ac.Ft.)	(Ac.Ft.)	(Acres)	(Ac.Ft.)	(Ac.Ft.)	(Ac.Ft.)	(Ac.Ft.)		
A	1	5,757			5,483	400						
B	4	2,330	270	150	2,712	130					50,200	
C	None											
D	1	670	165		380	50				2,500	29,000	
E	6	11,588	819	686	475	40		66			36,700	3,900
F	6	6,088	495	42	3,220	460					243,200	525
G	5	3,998	436	26	3,111	238					184,420	
H	3	5,252	431	400	963	177					40,000	2,500
I	4	18,521	1,398	8,460	1,924	900					40,000	15,200
J	6	5,368	540	1,654	3,986	120					70,900	7,145
Total	36	59,572	4,544	11,418	22,254	2,515		66		2,500	694,420	29,270

1/ To crest of emergency spillway.

TABLE XL - C

Upstream Watersheds - Investigated or Planned 1/ - Average Annual Flood Damages (dollars)

Watershed Name	State	Crop & Pasture	Other Agriculture	Residential & Commercial	Road & Bridge	Railroad	Sediment & Erosion	Indirect	Total
WATER SUB-REGION A									
Nescopek Creek	Pa.	22,600							22,600
WATER SUB-REGION B									
Marsh Ditch	N. Y.	15,320	5,460					3,120	23,900
New Berlin	N. Y.			8,400	3,600			2,400	14,400
Newtown-Hoffman Creek	N. Y.			89,030	9,140		11,450	23,850	133,470
Bentley Creek	Pa.	1,304		37,555				5,732	44,591
Total		16,624	5,460	134,985	12,740		11,450	35,102	216,361
WATER SUB-REGION C									
None									
WATER SUB-REGION D									
Camp-Cane Creek	N. C.	11,531	1,247		6,880		5,354	2,907	27,919
Turner Creek	N. C.	1,726			624			235	2,585
Little Beaver Dam Cr.	S. C.	1,748	592		3,994		17,479	2,838	26,651
Total		15,005	1,839		11,498		22,833	5,980	57,155
WATER SUB-REGION E									
Cahulga Creek	Ala.	7,657	2,798		510			1,148	12,113
Hudson River	Ga.	73,840	6,541		2,725		55,891	13,900	152,897
Suwanee Creek	Ga.	11,060	561	38,587	1,972		899	5,308	58,387
Tesnatee Creek	Ga.	34,832	495		973		1,100	2,625	40,025
Brown Creek	Miss.	150,664			42,416		18,115	19,308	230,503
Line Creek	Miss.	148,312	8,332		11,067			16,770	184,481
Total		426,365	18,727	38,587	59,663		76,005	59,059	678,406
WATER SUB-REGION F									
Short Creek	Ohio	3,168	1,465	77,810	24,901			11,979	119,323
Jacobs Creek	Pa.			194,241	6,244			37,365	237,850
Stonecoal Creek	W. Va.			13,435				2,291	15,726
Ten Mile Creek	W. Va.			30,983	8,077			5,858	44,918
Total		3,168	1,465	316,469	39,222			57,493	417,817

TABLE XL - C (continued)
Upstream Watersheds - Investigated or Planned 1/ - Average Annual Flood Damages (dollars)

Watershed Name	State	Crop & Pasture	Other Agriculture	Residential & Commercial	Road & Bridge	Railroad	Sediment & Erosion	Indirect	Total
WATER SUB-REGION G									
Grassy Creek	Ky.	4, 170	830		490			540	6, 030
Little Fork of Little Sandy	Ky.	22, 700	18, 200	4, 200	6, 200	900		6, 400	58, 600
Pine Creek	Ohio	45, 360	2, 918		23, 325			7, 160	78, 763
Elk-Two Mile Creek	W. Va.			48, 630	28, 547			15, 292	92, 469
Fourpole Creek	W. Va.			49, 699				4, 970	54, 669
Kanawha-Two Mile Cr.	W. Va.			16, 607	469			2, 757	19, 833
Rocky Fork	W. Va.			20, 700	500			4, 200	25, 400
Slack Branch	W. Va.			12, 600	3, 400			3, 200	19, 200
Total		72, 230	21, 948	152, 436	62, 931	900		44, 519	354, 964
WATER SUB-REGION H									
Redlick Creek	Ky.	10, 700	4, 900		4, 800			3, 000	23, 400
Upper Howard Creek	Ky.	2, 600	855		205			365	4, 025
Total		13. 300	5, 755		5, 005			3, 365	27, 425
WATER SUB-REGION I									
Marsh Creek	Ky.	2, 627	678				2, 944	625	6, 874
Roaring River	Tenn.	12, 545	500	5, 000	1, 250		1, 450	3, 400	24, 145
Smith Fork Creek	Tenn.	42, 100	3, 200	6, 000	25, 000		20, 000	13, 100	109, 400
Total		57, 272	4, 378	11, 000	26, 250		24, 394	17, 125	140, 419
WATER SUB-REGION J									
Cane Creek	N. C.	4, 600	500	47, 000	20, 700			11, 900	84, 700
French Broad River 2/	N. C.	577, 376		56, 341			137, 898	62, 476	834, 091
Boiling Fork Creek	Tenn.	5, 942	2, 989	5, 485	7, 042		16, 060	5, 428	42, 946
Hickory Creek	Tenn.	31, 000	3, 900		16, 300		18, 000	6, 900	76, 100
Horse Creek	Tenn.	28, 000	1, 200		6, 000		3, 000	4, 500	42, 700
Sweetwater Creek	Tenn.	32, 000	2, 100	45, 000	4, 200		4, 700	16, 000	104, 000
Upper Clinch Valley	Va.	608	122	35, 777	5, 790			8, 398	50, 695
Total		679, 526	10, 811	189, 603	60, 032		179, 658	115, 602	1, 235, 232
Grand Total		1, 306, 090	70, 383	843, 080	277, 341	900	314, 340	338, 245	3, 150, 379

1/ As of October 1967.
2/ Involved in comprehensive basin-wide study planned by TVA.

TABLE XL-C(1)

Summary - Upstream Watersheds - Investigated or Planned - Average Annual Flood Damages (Dollars)

Sub-Region	Crop and Pasture	Other Agriculture	Residential and Commercial	Road and Bridge	Railroad	Sediment and Erosion	Indirect	Total
A	22,600							22,600
B	16,624	5,460	134,985	12,740		11,450	35,102	216,361
C	None							
D	15,005	1,839		11,498		22,833	5,980	57,155
E	426,365	18,727	38,587	59,663		76,005	59,059	678,406
F	3,168	1,465	316,469	39,222			57,493	417,817
G	72,230	21,948	152,436	62,931	900		44,519	354,964
H	13,300	5,755		5,005			3,365	27,425
I	57,272	4,378	11,000	26,250		24,394	17,125	140,419
J	679,526	10,811	189,603	60,032		179,658	115,602	1,235,232
Total	1,306,090	70,383	843,080	277,341	900	314,340	338,245	3,150,379

TABLE XL - D

Upstream Watersheds - Investigated or Planned 1/ - Average Annual Benefits (dollars)

Watershed Name	State	Damage Reduction	More Intensive Land Use	Changed Land Use	Urban Land Enhancement	Irrigation	M & I Water Supply	Recreation	Secondary	Redevelopment	Incidental Recreation	Total	B/C Ratio 2/
WATER SUB-REGION A													
Nescopek Creek	Pa.	18,400										18,400	1.1:1
WATER SUB-REGION B													
Marsh Ditch	N.Y.	21,120							2,500	4,030		27,650	1.4:1
New Berlin	N.Y.	14,400						12,300	2,430	3,300		32,430	1.8:1
Newtown-Hoffman Creek	N.Y.	119,410			33,140			78,000	25,720	50,470		306,740	1.8:1
Bentley Creek	Pa.	42,000										42,000	0.58:1
Total		196,930			33,140			90,300	30,650	57,800		408,820	
WATER SUB-REGION C													
None													
WATER SUB-REGION D													
Camp-Cane Creek	N.C.	23,025	11,583					40,713	7,176	10,279		92,776	1.5:1
Turner Creek	N.C.	2,221	8,664						2,258			13,143	1.4:1
Little Beaver Dam Creek	S.C.	20,362	10,253						7,639	5,288	5,818	49,360	1.6:1
Total		45,608	30,500					40,713	17,073	15,567	5,818	155,279	
WATER SUB-REGION E													
Cahulga Creek	Ala.	9,718		1,006			14,297		1,485	2,535	3,150	32,191	2.1:1
Hudson River	Ga.	127,990	61,196			55,664			32,554	41,052		318,456	1.6:1
Suwanee Creek	Ga.	53,480	8,685	3,303					5,848	10,274		81,590	1.3:1
Tesnatee Creek	Ga.	27,160	15,260				4,623	51,637	9,790	12,399		120,869	1.8:1
Brown Creek	Miss.	152,659	73,723						22,724		4,895	254,001	2.5:1
Line Creek	Miss.	138,361						41,544	20,429		5,886	206,220	1.5:1
Total		509,368	158,864	4,309		55,664	18,920	93,181	92,830	66,260	13,931	1,013,327	
WATER SUB-REGION F													
Short Creek	Ohio	102,479						147,252	11,787	25,416		286,934	2.1:1
Jacobs Creek	Pa.	225,495		6,545				72,000	30,400	11,360		345,800	2.2:1
Stonecoal Creek	W. Va.	13,620						42,000	1,344	4,434		61,398	2.5:1
Ten Mile Creek	W. Va.	38,600					4,400	47,800	3,000	11,800		105,600	1.3:1
Total		380,194		6,545			4,400	309,052	46,531	53,010		799,732	

TABLE XL - D (continued)

Upstream Watersheds - Investigated or Planned 1/ - Average Annual Benefits (dollars)

Watershed Name	State	Damage Reduction	More Intensive Land Use	Changed Land Use	Urban Land Enhancement	Irrigation	M & I Water Supply	Recreation	Secondary	Redevelopment	Incidental Recreation	Total	B/C Ratio 2/
WATER SUB-REGION G													
Grassy Creek	Ky.	4,040	3,530					20,900	5,820	2,270		36,560	1.8:1
Little Fork of Little Sandy River	Ky.	47,220	10,740						6,870	12,630	8,640	86,100	1.02:1
Pine Creek	Ohio	72,871	27,705						11,470	18,797		130,843	2.04:1
Elk-Two Mile Creek	W. Va.	81,848							7,005	9,147		98,000	1.4:1
Fourpole Creek	W. Va.	47,434						52,747	4,642	9,255		113,978	1.8:1
Kanawha-Two Mile Creek	W. Va.	18,500						112,800	1,400	14,800	4,400	151,900	1.8:1
Slack Branch	W. Va.	17,500						30,000	1,500	10,200		59,200	1.3:1
Rocky Fork	W. Va.	19,300							1,700	2,800		23,800	1.4:1
Total		308,713	41,975					216,447	40,307	79,899	13,040	700,381	
WATER SUB-REGION H													
Redlick Creek	Ky.	17,100	9,000				4,500	20,000	6,800	6,500		63,900	1.6:1
Upper Howard Creek	Ky.	3,345	2,615					20,000	3,655	3,000		32,615	1.6:1
Total		20,445	11,615				4,500	40,000	10,455	9,500		96,515	
WATER SUB-REGION I													
Marsh Creek	Ky.	3,824		53,924								57,748	1.7:1
Roaring River	Tenn.	16,880	8,180				37,000	60,200	11,700	16,500		150,460	1.5:1
Smith Fork Creek	Tenn.	82,000	55,500				3,000		24,300	28,800	16,900	210,500	1.2:1
Total		102,704	63,680	53,924			40,000	60,200	36,000	45,300	16,900	418,708	
WATER SUB-REGION J													
Cane Creek	N. C.	50,900	24,000					25,200	11,000	14,700		125,800	1.3:1
French Broad River 3/	N. C.	593,801	116,389						76,785			786,975	3.5:1
Boiling Fork Creek	Tenn.	31,074							3,345	5,409		39,828	1.4:1
Hickory Creek	Tenn.	55,500	27,500						11,200	12,700	10,300	117,200	1.8:1
Horse Creek	Tenn.	33,300						46,700	8,700	12,700		101,400	1.4:1
Sweetwater Creek	Tenn.	83,200					4,000	16,400	10,300	12,200		126,100	1.8:1
Upper Clinch Valley	Va.	47,004	881				14,899		5,620	10,414	1,180	79,998	1.5:1
Total		894,779	168,770				18,899	88,300	126,950	68,123	11,480	1,377,301	
Grand Total		2,477,141	475,404	64,778	33,140	55,664	86,719	938,193	400,796	395,459	61,169	4,988,463	

1/ As of October 1967.
2/ Feasible project if B/C ratio is 1.0:1 or greater.
3/ Included in comprehensive basin-wide study planned by TVA.

TABLE XL-D(1)

Summary - Upstream Watersheds - Investigated or Planned - Average Annual Benefits (Dollars)

Sub-Region	Damage Reduction	More Intensive Land Use	Changed Land Use	Urban Land Enhancement	Irrigation	M & I Water Supply	Recreation	Secondary	Redevelopment	Incidental Recreation	Total
A	18,400										18,400
B	196,930			33,140			90,300	30,650	57,800		408,820
C	None										
D	45,608	30,500					40,713	17,073	15,567	5,818	155,279
E	509,368	158,864	4,309		55,664	18,920	93,181	92,830	66,260	13,931	1,013,327
F	380,194		6,545			4,400	309,052	46,531	53,010		799,732
G	308,713	41,975					216,447	40,307	79,899	13,040	700,381
H	20,445	11,615				4,500	40,000	10,455	9,500		96,515
I	102,704	63,680	53,924			40,000	60,200	36,000	45,300	16,900	418,708
J	894,779	168,770				18,899	88,300	126,950	68,123	11,480	1,377,301
Total	2,477,141	475,404	64,778	33,140	55,664	86,719	938,193	400,796	395,459	61,169	4,988,463

TABLE XL-E

Upstream Watersheds - Investigated or Planned 1/ - Cost Allocation ($1,000)

No.	Watershed Name	State	Flood Prevention	M & I Water Supply	Recreation	Basic Facilities	Irrigation	Total
	WATER SUB-REGION A							
42	Nescopeck Creek	Pa.	770.1		739.9			1,510.0
	WATER SUB-REGION B							
16	Marsh Ditch	N.Y.	450.5					450.5
22	New Berlin	N.Y.	237.4		177.6			415.0
17	Newtown-Hoffman Cr.	N.Y.	3,988.1	85.5	138.5	243.6		4,455.7
21	Bentley Creek	Pa.	1,791.8		252.0			2,043.8
	Total		6,467.8	85.5	568.1	243.6		7,365.0
	WATER SUB-REGION C							
	None							
	WATER SUB-REGION D							
8	Camp-Cane Creek	N.C.	902.2		58.7	207.4		1,168.3

TABLE XL-E (continued)
Upstream Watersheds - Investigated or Planned 1/ - Cost Allocation ($1,000)

No.	Watershed Name	State	Flood Prevention	M & I Water Supply	Recreation	Basic Facilities	Irrigation	Total
	WATER SUB-REGION D (continued)							
15	Turner Creek	N.C.	183.7					183.7
15	Little Beaver Dam	S.C.	773.5					773.5
	Total		1,859.4		58.7	207.4		2,125.5
	WATER SUB-REGION E							
20	Cahulga Creek	Ala.	291.6	124.8				416.4
46	Hudson River	Ga.	3,846.3				5.9	3,852.2
55	Suwanee Creek	Ga.	1,486.5					1,486.5
56	Tesnatee Creek	Ga.	1,045.3	11.2	281.0			1,337.5
26	Brown Creek	Miss.	2,756.5					2,756.5
27	Line Creek	Miss.	4,930.4					4,930.4
	Total		14,356.5	136.0	281.0		5.9	14,779.5
	WATER SUB-REGION F							
8	Short Creek	Ohio	2,404.2		500.0	231.2		3,135.4
33	Jacobs Creek	Pa.	3,049.8		702.0	71.6		3,823.4
63	Stonecoal Creek	W.Va.	395.8		208.9			604.7
64	Ten Mile Creek	W.Va.	1,432.5	98.2	304.9	253.4		2,089.0
	Total		7,282.3	98.2	1,715.8	556.2		9,652.5

TABLE XL-E (continued)
Upstream Watersheds - Investigated or Planned 1/ - Cost Allocation ($1,000)

No.	Watershed Name	State	Flood Prevention	M & I Water Supply	Recreation	Basic Facilities	Irrigation	Total
	WATER SUB-REGION G							
7	Grassy Creek	Ky.	241.2		171.4	43.0		455.6
8	Little Fork of Sandy River	Ky.	2,759.2					2,759.2
7	Pine Creek	Ohio	1,640.6					1,640.6
29	Elk Two Mile Creek	W.Va.	2,092.1					2,092.1
32	Fourpole Creek	W.Va.	640.4		458.3	293.8		1,392.5
38	Kanawha-Two Mile Cr.	W.Va.	859.8		452.8	473.3		1,785.9
59	Rocky Fork Creek	W.Va.	378.8					378.8
61	Slack Branch (Quick)	W.Va.	728.8		460.2	100.0		1,289.0
	Total		9,340.9		1,542.7	910.1		11,793.7
	WATER SUB-REGION H							
12	Redlick Creek	Ky.	729.2	92.2	41.6	108.0		971.0
24	Upper Howard Creek	Ky.	270.5		44.0	109.0		423.5
	Total		999.7	92.2	85.6	217.0		1,394.5
	WATER SUB-REGION I							
10	Marsh Creek	Ky.	715.3					715.3
14	Roaring River	Tenn.	1,278.0	529.2	184.9	507.9		2,500.0
15	Smith Fork Creek	Tenn.	5,166.3	39.0				5,205.3
	Total		7,159.6	568.2	184.9	507.9		8,420.6

TABLE XL-E (continued)
Upstream Watersheds - Investigated or Planned 1/ - Cost Allocation ($1,000)

No.	Watershed Name	State	Flood Prevention	M & I Water Supply	Recreation	Basic Facilities	Irrigation	Total
	WATER SUB-REGION J							
7	Cane Creek	N.C.	1,551.5		672.5	158.0		2,382.0
10	French Broad River	N.C.	5,159.3					5,159.3
9	Boiling Fork Creek	Tenn.	614.3					614.3
12	Hickory Creek	Tenn.	1,836.5					1,836.5
13	Horse Creek	Tenn.	1,170.7		174.6	440.8		1,786.1
16	Sweetwater Creek	Tenn.	1,407.6	68.7	90.8	145.6		1,712.7
64	Upper Clinch Valley	Va.	1,266.6	284.4				1,551.0
	Total		13,006.5	353.1	937.9	744.4		15,041.9
	Grand Total		61,242.9	1,333.2	6,114.6	3,386.6	5.9	72,083.2

1/ As of October 1967.

TABLE XL-E(1)

Summary - Upstream Watersheds - Investigated or Planned 1/ - Cost Allocation ($1,000)

Sub-Region	Flood Prevention	M & I Water Supply	Recreation	Basic Facilities	Irrigation	Total
A	770.1		739.9			1,510.0
B	6,467.8	85.5	568.1	243.6		7,365.0
C	None					
D	1,859.4		58.7	207.4		2,125.5
E	14,356.6	136.0	281.0		5.9	14,779.5
F	7,282.3	98.2	1,715.8	556.2		9,652.5
G	9,340.9		1,542.7	910.1		11,793.7
H	999.7	92.2	85.6	217.0		1,394.5
I	7,159.6	568.2	184.9	507.9		8,420.6
J	13,006.5	353.1	937.9	744.4		15,041.9
Total	61,242.9	1,333.2	6,114.6	3,386.6	5.9	72,083.2

1/ As of October 1967.

TABLE XLI - A

Upstream Watersheds - Potential - Water Resource Survey 1/ - Structural Measures

Watershed Name	State	Watershed Area	No. of Structures	Drainage Area Controlled	STORAGE VOLUME BY PURPOSE: Flood Prevention	M & I Water Supply	Recreation	Fish & Wildlife	Irrigation	Water Quality	Total 2/	Additional Storage Beneficial Uses	Channel Improvement	ESTIMATED INSTALLATION COST: Identified Needs	Full Development	Floodplain Area
		(Sq. Mi.)	(No.)	(Sq. Mi.)	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	(Miles)	($1,000)	($1,000)	(Acres)
WATER SUB-REGION A																
None																
WATER SUB-REGION B																
Georges Creek	Md.	74.80	5	29.1	5,700						5,700			2,159.2	2,159.2	750
Little Beaver Cr.	Md.	9.11	0													90
Upper Casselman River	Md.	131.50	5	60.6	12,115	1,035	9,110	4,000			26,260	11,000		1,979.1	2,152.3	900
Cayuga Inlet	N. Y.	284.00	7	77.6	14,510						14,510	22,715		2,078.0	3,830.0	3,072
West Branch Delaware R.	N. Y.	362.00	12	177.3	33,103						33,103	77,721		8,210.0	18,510.0	6,000
Stony Creek	Pa.	465.00	5	124.3	19,490		15,830				35,320	2,560		7,851.2	8,148.2	4,030
Wills Creek	Pa.	196.70	4	46.9	8,555	500	13,350				22,405	11,215		5,121.1	8,126.4	330
Total		1,523.11	38	515.8	93,473	1,535	38,290	4,000			137,298	125,211		27,398.6	42,926.1	15,172
WATER SUB-REGION C																
None																
WATER SUB-REGION D																
N. Oconee River	Ga.	89.53	9	44.8	13,015	1,470					14,485	4,655	39.4	1,971.7	2,832.9	5,680
Hunting Bear Cr.	N. C.	327.73	13	166.2	30,940						30,940	73,530	55.6	5,879.0	12,263.0	4,600
U. South Yadkin	N. C.	65.78	4	50.8	14,165	1,500	260				15,925	19,820	8.0	1,087.9	4,062.4	1,140
Cherokee Creek	S. C.	23.06	1	10.2	3,685	3,265					6,950			370.5	370.5	135
Eighteen Mile Cr.	S. C.	52.03	4	30.2	9,645	1,000	630				11,275	10,430	11.0	1,734.2	2,177.2	1,300
N. & Middle Tyger River	S. C.	169.40	10	135.2	35,950	3,200	3,745		2,250	13,575	58,720		19.0	3,922.9	4,536.6	2,600
South Pacolet R.	S. C.	90.61	5	30.9	9,420	5,750	670		1,005		16,845		9.0	2,359.1	2,359.1	1,300
Total		818.14	46	468.3	116,820	16,185	5,305		3,255	13,575	155,140	108,435	142.0	17,325.3	28,601.7	16,755

TABLE XLI - A (continued)

Upstream Watersheds - Potential - Water Resource Survey 1/ - Structural Measures

Watershed Name	State	Water-shed Area	No. of Struc-tures	Drain-age Area Con-trolled	STORAGE VOLUME BY PURPOSE: Flood Pre-vention	M & I Water Supply	Recrea-tion	Fish & Wild-life	Irriga-tion	Water Quality	Total 2/	Addi-tional Storage Benefi-cial Uses	Channel Improve-ment	ESTIMATED INSTALLATION COST: Identi-fied Needs	Full Develop-ment	Flood-plain Area
		(Sq. Mi.)	(No.)	(Sq. Mi.)	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	(Miles)	($1,000)	($1,000)	(Acres)
WATER SUB-REGION E																
Dyne Creek	Ala.	23.75	2	10.3	2,205						2,205	1,650	5.4	388.6	569.9	1,200
Sipsey Creek	Ala.	225.31	21	84.09	32,005						32,005	44,860	61.0	6,079.6	10,132.8	25,700
Jacks & Socapotay	Ala.	75.16	1	15.4	3,815		2,465				6,280			718.7	718.7	
Little Sandy Cr.	Ala.	63.28	3	4.66	1,345		2,490				3,835		1.0	757.8		2,000
Luxapalila Cr.	Ala.	306.88	27	114.20	41,855	3,200	1,400				46,455	11,120	29.0	4,843.9	5,888.1	32,600
Mahan Creek	Ala.	42.20	2	22.90	5,555		200				5,755	3,465	2.7	535.0	773.2	600
Mill Creek	Ala.	77.97	3	19.8	5,670						5,670	3,160	15.0	901.4	1,094.2	2,000
Wehadkee Cr.	Ala.	32.03	2	11.9	3,070						3,070	1,910	2.7	397.3	641.8	1,100
Mill Creek Area	Ga.	65.54	5	22.1	757						757	7,555	8.8	613.5	1,730.5	3,580
Wahoo-Little R.	Ga.	118.12	5	28.5	6,825	100					6,925	9,980	3.5	566.9	1,083.5	4,440
Young Cane Cr.	Ga.	32.41	4	9.9	2,225						2,225	1,160	24.0	587.8	900.4	1,400
Total		1,062.65	75	343.75	105,327	3,300	6,555				115,182	84,860	153.1	16,390.5	23,533.1	74,620
WATER SUB-REGION F																
Great Valley	N. Y.	141.00	6	71.5	10,980						10,980	15,280	0.47	2,791.1	4,878.5	2,000
Little Valley	N. Y.	47.40	2	4.2	785		660				1,445	855		552.4	2,406.7	
Blacklick Creek	Pa.	390.63	2	36.3	6,555		8,640				15,195	2,190		5,085.7	5,732.3	200
Brokenstraw Cr.	Pa.	337.03	6	152.3	26,280		16,940				43,220	10,630		5,787.7	7,558.9	6,000
Connoquenessing Creek	Pa.	323.91	21	147.0	27,605	10,595	5,450				43,650	30,020		14,637.3	21,459.8	2,000
French Creek	Pa.	184.38	3	103.5	17,700	18,910	11,885				48,495			8,099.3	8,099.3	2,600
Indian Creek	Pa.	124.06	4	35.8	6,760	9,330	2,665				18,755	7,090		4,600.6	8,598.1	400
Le Boeuf Cr.	Pa.	62.00	1	21.5	3,700	4,460	1,990				10,150			4,118.0	4,118.0	500
Mahoning Cr.	Pa.	420.00	3	49.2	9,080		9,985				19,065	6,910		5,005.0	5,966.7	1,150
Oswago Cr.	Pa.	247.97	5	21.1	3,890		6,610				10,500			4,962.5	4,962.5	2,000
Potato Creek	Pa.	226.49	3	43.5	7,920		7,530				15,450	4,100		3,980.2	5,666.0	3,000
Raccoon Creek	Pa.	182.19	3	16.7	3,140	2,895	3,795				9,830			1,921.8	1,921.8	2,000
Sandy Lick Cr.	Pa.	231.35	4	36.2	6,635	7,140	6,375				20,150	7,945		5,602.1	6,541.7	1,300
Sewickley Cr.	Pa.	166.09	2	4.4	835	1,410					2,245		2.13	3,528.8	3,528.8	100
Sugar Creek	Pa.	166.00	2	62.4	10,690		20,310				31,000	8,000		7,583.1	12,983.0	1,000
Tionesta Cr.	Pa.	300.00	5	63.4	11,690		2,960				14,650	29,740		3,979.6	8,646.3	1,600
Turtle Creek	Pa.	146.56	4	11.6	2,205	1,950	2,830				6,985	1,010		3,344.8	3,594.0	
U. Allegheny R.	Pa.	227.34	7	64.4	11,890		1,880				13,770	15,940		6,362.8	9,222.2	950
U. Loyalhanna Creek	Pa.	211.50	7	53.5	10,150	3,440	12,090				25,680	17,310		7,621.4	10,813.7	
W. Branch Clarion River	Pa.	94.70	4	24.9	4,520	2,220	2,825				9,565	11,070		4,751.2	6,783.9	400

TABLE XLI - A (continued)

Upstream Watersheds - Potential - Water Resource Survey 1/ - Structural Measures

Watershed Name	State	Watershed Area	No. of Structures	Drainage Area Controlled	STORAGE VOLUME BY PURPOSE: Flood Prevention	M & I Water Supply	Recreation	Fish & Wildlife	Irrigation	Water Quality	Total 2/	Additional Storage Beneficial Uses	Channel Improvement	ESTIMATED INSTALLATION COST: Identified Needs	Full Development	Floodplain Area
		(Sq. Mi.)	(No.)	(Sq. Mi.)	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	(Miles)	($1,000)	($1,000)	(Acres)
WATER SUB-REGION F (continued)																
Elk Creek	W. Va.	119.82	11	59.6	14,820		2,755				17,575	21,060		4,142.9	5,618.4	1,291
Kings Creek	W. Va.	49.84	2	36.1	7,475		1,835				9,310	12,330		1,194.5	1,980.8	165
Limestone Run	W. Va.	10.27	1	1.1	235		1,390				1,625	,600	0.93	890.7	965.3	52
Paw Paw Cr.	W. Va.	41.33	5	5.3	1,405	160	305				1,870	1,600		1,719.5	2,107.8	93
Prickett Cr.	W. Va.	24.35	2	12.3	3,000		695				3,695	8,050		700.4	1,952.7	116
Sandy Creek	W. Va.	87.99	4	14.2	3,160		1,305				4,465	5,510		2,107.2	3,290.9	560
Simpson Creek	W. Va.	72.73	11	33.8	8,740	2,070	3,000				13,810	6,630		2,618.7	3,268.4	880
Three Fork Cr.	W. Va.	100.10	5	54.1	11,825		1,200				13,025	23,185	0.37	2,515.6	3,578.3	227
U. Middle Island Creek	W. Va.	113.05	5	75.6	18,025		350				18,375	13,520		4,124.4	4,761.7	730
U. West Fork River	W. Va.	28.90	6	14.9	3,580						3,580	5,055		1,433.8	1,866.2	170
Total		4,878.98	146	1,330.4	255,275	64,580	138,255				458,110	265,630	3.90	125,763.1	172,872.7	31,484
WATER SUB-REGION G																
E. Fork Little Sandy	Ky.	154.06	7	33.5	7,495		150				7,645	27,920		1,503.4	3,466.7	3,900
Triplett Creek	Ky.	187.00	19	67.4	12,565		440				13,005	36,880		3,720.6	8,305.3	4,600
Upper Licking Cr.	Ky.	For details, see Interim Survey Report on Upper Licking River Basin														
Federal Valley	Ohio	144.91	11	52.6	10,990	200	4,940				16,130	14,500	14.0	3,192.9	4,873.2	2,820
Little Salt Cr.	Ohio	138.70	13	47.8	11,490		3,190				14,680	7,325	14.6	3,269.3	4,739.9	4,800
Little Scioto R.	Ohio	232.60	10	93.5	18,540		6,560				25,100	9,960		2,949.7	4,141.3	3,570
Moxahala-Jonathan Cr.	Ohio	300.70	10	102.1	20,185	670	16,880				37,735	8,310		3,906.0	4,552.0	4,600
O'Bannon Cr.	Ohio	58.50	6	19.3	4,485		1,660				6,145	555		1,973.0	2,039.9	
U. White Oak Cr.	Ohio	234.30	6	72.1	15,180		5,380				20,560	6,480		2,782.0	3,243.0	3,330
Wakatomika Cr.	Ohio	233.90	7	91.1	17,845		15,600				33,445	13,725	25.0	4,996.0	6,303.0	7,220
Wolf Creek	Ohio	230.90	11	152.5	29,130	1,100	19,965				50,195	18,715		4,719.0	5,951.0	3,300
Headwaters Holston River	Va.	234.80	6	162.6	29,950	11,000	8,175				49,125	47,435		5,326.0	9,350.8	2,512
French Cr.	W. Va.	49.08	4	32.3	8,145		985				9,130	10,585		1,762.7	2,474.1	138
Mate Creek	W. Va.	16.38	3	8.3	2,025	1,030	2,570				5,625	435		2,599.7	2,858.1	90
Big Creek	W. Va.	27.06	1	1.3	340		2,125				2,465	1,040	6.7	1,274.4	1,471.7	422
U. Buckhannon R.	W. Va.	148.11	10	51.9	12,485		575				13,060	13,305		4,839.6	5,935.9	
Total		2,391.00	124	988.3	200,850	14,000	89,195				304,045	217,170	60.3	48,814.3	69,705.9	41,302

TABLE XLI - A (continued)

Upstream Watersheds - Potential - Water Resource Survey 1/ - Structural Measures

Watershed Name	State	Watershed Area	No. of Structures	Drainage Area Controlled	Flood Prevention	M & I Water Supply	Recreation	Fish & Wildlife	Irrigation	Water Quality	Total 2/	Additional Storage Beneficial Uses	Channel Improvement	Estimated Installation Cost: Identified Needs	Estimated Installation Cost: Full Development	Floodplain Area
		(Sq. Mi.)	(No.)	(Sq. Mi.)	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	(Miles)	($1,000)	($1,000)	(Acres)
WATER SUB-REGION H																
Hanging Fork Cr.	Ky.	95.80	7	50.3	10,180		2,355				12,535	28,770		1,172.0	2,828.5	835
Silver Creek	Ky.	126.00	3	49.3	13,020		320				13,340	2,550		1,318.2	1,461.1	1,580
Upper Red R.	Ky.	63.60	6	28.2	5,020	200	220				5,440	14,980		1,274.5	2,513.7	1,540
Total		285.40	16	127.8	28,220	200	2,895				31,315	46,300		3,764.7	6,803.3	3,955
WATER SUB-REGION I																
Casey Creek	Ky.	92.66	8	32.3	6,100		315				6,415	15,005		1,360.2	2,443.5	2,500
Marrowbone Cr.	Ky.	86.80	8	39.6	9,135	190	475				9,800	22,170		1,451.2	2,888.9	1,440
Richland Creek	Ky.	74.00	5	37.2	7,810		180				7,990	21,510	22.0	1,830.2	3,210.4	1,900
Russell Creek	Ky.	289.00	7	158.4	40,244	1,000	1,331				42,575	33,700		3,344.0	4,737.0	3,160
Calfkiller River	Tenn.	192.00	5	146.9	22,830	3,500	5,860				32,190	6,810		4,463.0	4,876.5	1,200
Putnam-Cane Creek	Tenn.	23.59	2	3.5	880		190				1,070		8.84	513.4	513.4	677
L. Indian Cr. and Buffalo Cr.	Tenn.	35.63	2	14.7	4,100						4,100	7,000	13.3	1,264.4	1,782.5	448
Salt Lick Creek	Tenn.	117.54	9	57.2	12,495	2,200	1,450				16,145	11,800	40.5	2,908.1	4,116.4	2,659
Total		911.22	46	489.8	103,594	6,890	9,801				120,285	117,995	84.64	17,134.5	24,568.6	13,984
WATER SUB-REGION J																
Cane Creek	Ala.	60.00	2	20.0	4,450						4,450	3,200		302.7	538.4	1,220
Cypress Creek	Ala.	210.94	20	95.2	37,800	500	400		250		38,950	13,040	57.3	5,009.1	5,390.4	21,200
Limestone Cr.	A a.	143.91	4	80.2	22,260	2,200					24,460	11,710	21.3	2,605.1	3,169.1	6,000
Little Bear Cr.	Ala.	71.25	1	30.7	6,720						6,720	4,910	5.0	533.5	851.6	770
Headwaters Chattooga R.	Ga.	164.69	8	73.8	20,300	4,200	935				25,435	4,750	23.13	3,780.4	4,352.3	5,700
Peavine Creek	Ga.	34.22	5	32.8	6,830	370	365				7,565	1,230	15.43	1,692.8	1,925.2	1,615
Tallulah Creek 3/	N. C.	62.20	8	30.0	6,995	160					7,155	7,460		3,385.0	4,860.0	2,125
Bent Creek	Tenn.	46.72	9	18.4	6,030	940					6,970	6,660	25.95	1,466.1	1,845.1	1,620
Blackwater Cr.	Tenn.	45.00	3	17.2	5,260		530				5,790	1,740	27.56	1,547.2	2,346.2	1,730
Black Wolf Cr.	Tenn.	33.59	2	15.6	4,320						4,320	8,850	12.30	684.1	1,613.4	1,175
Bull Run Cr.	Tenn.	106.53	4	32.7	10,230		2,550				12,780	3,960	29.55	1,803.3	2,109.4	1,774
Charles Creek	Tenn.	34.84	3	15.0	4,380						4,380	1,900	19.68	680.0	823.1	1,290
Coahulla Creek	Tenn.	60.16	6	21.2	5,260	2,450	100	415			8,225	3,960	38.83	1,663.2	1,801.3	2,350
Mountain Cr.	Tenn.	48.33	2	17.8	4,900						4,900	2,200	26.89	769.7	942.0	1,100

TABLE XLI - A (continued)

Upstream Watersheds - Potential - Water Resource Survey 1/ - Structural Measures

Watershed Name	State	Watershed Area (Sq. Mi.)	No. of Structures (No.)	Drainage Area Controlled (Sq. Mi.)	Storage Volume by Purpose: Flood Prevention (AF)	M & I Water Supply (AF)	Recreation (AF)	Fish & Wildlife (AF)	Irrigation (AF)	Water Quality (AF)	Total 2/ (AF)
WATER SUB-REGION J (continued)											
Perkins Creek	Tenn.	19.98	2	7.0	2,095	500	500				3,095
Copper Creek	Va.	133.28	7	61.5	11,485						11,485
Headwaters											
Clinch River	Va.	123.38	9	92.4	17,254	800					18,054
Indian Creek	Va.	67.08	8	16.7	4,070	350	1,600				6,020
Martin Creek	Va.	23.98	2	5.4	1,185		850			360	2,395
Total		1,490.08	105	683.6	181,824	12,470	7,830	415	250	360	203,149
Grand Total		13,360.58	596	4,947.8	1,085,383	119,160	298,126	4,415	3,505	13,935	1,524,524

Watershed Name	Additional Storage Beneficial Uses (AF)	Channel Improvement (Miles)	Estimated Installation Cost: Identified Needs ($1,000)	Estimated Installation Cost: Full Development ($1,000)	Floodplain Area (Acres)
WATER SUB-REGION J (continued)					
Perkins Creek		12.50	118.0	732.0	850
Copper Creek	2,595		2,127.0	2,630.7	1,133
Headwaters					
Clinch River	33,030		2,540.9	6,155.0	1,350
Indian Creek	6,015		2,111.6	3,884.3	874
Martin Creek	1,220		518.6	617.5	315
Total	118,430	315.42	33,338.3	46,587.0	54,191
Grand Total	1,084,031	759.36	289,929.3	415,598.4	251,463

1/ As of October 1967.

2/ Emergency spillway crest.

3/ The U. S. Forest Service will make a detailed study and appraisal to supplement the proposed project before authorization for detailed planning is initiated.

TABLE XLI-A(1)

Summary - Upstream Watersheds - Potential - Water Resource Survey 1/ - Structural Measures

Sub-Region	Project Area	No. of Structures	Drainage Area Controlled	STORAGE VOLUME BY PURPOSE: Flood Prevention 2/	M & I Water Supply	Recreation	Fish and Wildlife	Irrigation	Water Quality	Total	Additional Storage Beneficial Uses	Channel Improvement	Estimated Installation Cost: Identified Needs	Full Development	Flood-plain Area
	(Sq.Mi.)	(No.)	(Sq.Mi.)	(Ac.Ft.)	(Ac.Ft.)	(Ac.Ft.)	(Ac.Ft.)	(Ac.Ft.)	(Ac.Ft.)	(Ac.Ft.)	(Ac.Ft.)	(Miles)	($1,000)	($1,000)	(Acres)
A	None														
B	1,523.11	38	515.8	93,473	1,535	38,290	4,000			137,298	125,211		27,398.6	42,926.1	15,172
C	None														
D	818.14	46	468.3	116,820	16,185	5,305		3,255	13,575	155,140	108,435	142.0	17,325.3	28,601.7	16,755
E	1,062.65	75	343.75	105,327	3,300	6,555				115,182	84,860	153.1	16,390.5	23,533.1	74,620
F	4,878.98	146	1,330.4	255,275	64,580	138,255				458,110	265,630	3.9	125,763.1	172,872.7	31,484
G	2,391.00	124	988.3	200,850	14,000	89,195				304,045	217,170	60.3	48,814.3	69,705.9	41,302
H	285.40	16	127.8	28,220	200	2,895				31,315	46,300		3,764.7	6,803.3	3,955
I	911.22	46	489.8	103,594	6,890	9,801				120,285	117,995	84.64	17,134.5	24,568.6	13,984
J	1,490.08	105	683.6	181,824	12,470	7,830	415	250	360	203,149	118,430	315.42	33,338.3	46,587.0	54,191
Total	13,360.58	596	4,947.8	1,085,383	119,160	298,126	4,415	3,505	13,935	1,425,524	1,084,031	759.36	289,929.3	415,598.4	251,463

1/ As of October 1967.
2/ To crest of emergency spillway.

TABLE XLI - B

Upstream Watersheds - Potential - Water Resource Survey 1/ - Multiple-Purpose Structures

Watershed Name	State	No. of Structures	STORAGE VOLUME AND SURFACE AREA BY PURPOSE								Additional Beneficial Storage	Estimated Recreation Days Provided	Population Served by Water Supply
			Flood Prevention		M & I Water Supply	Recreation		Fish & Wildlife	Irrigation	Water Quality			
		(No.)	(Ac. Ft.)	(Acres)2/	(Ac. Ft.)	(Ac. Ft.)	(Acres)	(Ac. Ft.)	(Ac. Ft.)	(Ac. Ft.)	(Ac. Ft.)		
WATER SUB-REGION A													
None													
WATER SUB-REGION B													
Upper Casselman River	Md.	4	11,205	1,047	1,035	9,110	288	4,000			11,000	76,800	
Stony Creek	Pa.	3	5,970	1,035		15,830	870					150,000	
Wills Creek	Pa.	1	4,690	500	500	13,350	440					236,000	1,124
Total		8	21,865	2,582	1,535	38,290	1,598	4,000			11,000	462,800	1,124
WATER SUB-REGION C													
None													
WATER SUB-REGION D													
North Oconee River	Ga.	2	3,415	260	1,470								1,400
Upper South Yadkin R.	N. C.	2	3,055	210	1,500	260	50				4,500	18,000	
Cherokee Creek	S. C.	1	3,685	355	3,265								18,000
Eighteen Mile Creek	S. C.	3	8,805	1,140	1,000	630	200				10,110	57,600	4,200
North and Middle Tyger River	S. C.	8	20,645	2,075	3,200	3,745	455		2,250	13,575		79,000	1,260
South Pacolet River	S. C.	5	9,420	875	5,750	670	125		1,005			94,000	97,000
Total		21	49,025	4,915	16,185	5,305	830		3,255	13,575	14,610	248,600	121,860
WATER SUB-REGION E													
Jacks & Socapotay Cr.	Ala.	1	3,815	415		2,465	277					41,550	
Little Sandy Creek	Ala.	3	1,345	225		2,490	184					27,600	
Luxapalila Creek	Ala.	5	12,845	1,720	3,200	1,400	200				700	7,500	19,300
Mahan Creek	Ala.	1	4,510	495		200	80				2,785	12,000	
Mill Creek Area	Ga.	1	757	135							410		
Wahoo-Little River	Ga.	1	1,410	105	100								300
Total		12	24,682	3,095	3,300	6,555	741				3,895	88,650	19,600
WATER SUB-REGION F													
Little Valley	N. Y.	1	300	65		660	50					6,500	
Blacklick Creek	Pa.	1	2,645	305		8,640	285					157,500	

TABLE XLI - B (continued)

Upstream Watersheds - Potential - Water Resource Survey 1/ - Multiple-Purpose Structures

Watershed Name	State	No. of Structures	STORAGE VOLUME AND SURFACE AREA BY PURPOSE: Flood Prevention		M & I Water Supply	Recreation		Fish & Wildlife	Irrigation	Water Quality	Additional Beneficial Storage	Estimated Recreation Days Provided	Population Served by Water Supply
		(No.)	(Ac. Ft.)	(Acres)2/	(Ac. Ft.)	(Ac. Ft.)	(Acres)	(Ac. Ft.)	(Ac. Ft.)	(Ac. Ft.)	(Ac. Ft.)		
WATER SUB-REGION F (continued)													
Brokenstraw Creek	Pa.	2	5,705	1,575		16,940	1,200					535,500	
Connoquenessing Cr.	Pa.	7	13,775	1,220	10,595	5,450	500					420,000	42,260
French Creek (Upper)	Pa.	2	10,335	3,420	18,910	11,885	1,460					787,400	143,000
Indian Creek	Pa.	2	4,240	680	9,330	2,665	165					105,500	
LeBoeuf Creek	Pa.	1	3,700	405	4,460	1,990	200					560,000	
Mahoning Creek	Pa.	1	5,015	560		9,985	450				6,500	245,000	
Oswago Creek	Pa.	2	3,050	520		6,610	450					337,600	
Potato Creek	Pa.	1	2,270	220		7,530	190					70,000	
Raccoon Creek	Pa.	3	3,140	350	2,895	3,795	195					72,900	
Sandy Lick Creek	Pa.	4	6,635	625	7,140	6,375	505				7,945	140,000	
Sewickley Creek	Pa.	1	455	130	1,410								
Sugar Creek	Pa.	2	10,690	1,880		20,310	1,550				8,000	910,000	
Tionesta Creek	Pa.	2	6,590	435		2,960	260				11,340	372,000	
Turtle Creek	Pa.	4	2,205	315	1,950	2,830	155				1,010	164,500	
Upper Allegheny R.	Pa.	2	5,090	405		1,880	130				5,000	210,000	
Upper Loyalhanna Cr.	Pa.	2	4,800	815	3,440	12,090	540					472,400	11,931
W. Branch Clarion R.	Pa.	3	2,710	430	2,220	2,825	135				4,350	438,400	
Elk Creek	W. Va.	1	3,045	362		2,755	250					100,000	
Kings Creek	W. Va.	1	4,695	430		1,835	100				10,580	74,000	
Limestone Run	W. Va.	1	1,390	65		1,390	50				600	39,600	
Paw Paw Creek	W. Va.	2	510	60	160	305	20				265	17,000	650
Prickett Creek	W. Va.	1	2,515	280		695	50				6,750	35,400	
Sandy Creek	W. Va.	1	1,250	70		1,305	50					39,600	
Simpson Creek	W. Va.	3	3,040	365	2,070	3,000	160				430	25,500	6,000
Three Fork Creek	W. Va.	1	9,890	615		1,200	100				23,185	79,000	
Upper Middle Island Creek	W. Va.	1	1,855	100		350	50					39,600	
Total		55	121,540	16,702	64,580	138,255	9,250				85,955	6,454,900	203,841
WATER SUB-REGION G													
East Fork Little Sandy	Ky.	1	1,620	170		150	80				5,870	20,000	
Triplett Creek	Ky.	1	3,200	470		440	88				9,685	20,000	
Upper Licking River	Ky.	---------- For details, see Interim Survey Report on Upper Licking River Basin ----------											
Federal Valley	Ohio	2	3,010	490	200	4,940	400					110,000	400
Little Salt Creek	Ohio	2	2,925	315		3,190	255					51,000	
Little Scioto River	Ohio	2	3,665	720		6,560	601					114,190	
Moxahala-Jonathan Cr.	Ohio	3	9,035	1,235	670	16,880	980					192,000	1,750
O'Bannon Creek	Ohio	1	1,560	170		1,660	120					35,400	

TABLE XLI - B (continued

Upstream Watersheds - Potential - Water Resource Survey 1/ - Multiple-Purpose Structures

Watershed Name	State	No. of Structures	STORAGE VOLUME AND SURFACE AREA BY PURPOSE: Flood Prevention		M & I Water Supply	Recreation		Fish & Wildlife	Irrigation	Water Quality	Additional Beneficial Storage	Estimated Recreation Days Provided	Population Served by Water Supply
		(No.)	(Ac. Ft.)	(Acres)2/	(Ac. Ft.)	(Ac. Ft.)	(Acres)	(Ac. Ft.)	(Ac. Ft.)	(Ac. Ft.)	(Ac. Ft.)		
WATER SUB-REGION G (continued)													
Upper White Oak Cr.	Ohio	1	4,990	800		5,380	580					87,000	
Wakatomika Creek	Ohio	1	9,380	790		15,600	680					136,000	
Wolf Creek	Ohio	3	11,440	1,720	1,100	19,965	1,450					304,500	
Headwaters Holston R.	Va.	3	17,085	1,170	11,000	8,175	280				18,165	200,000	3,500
French Creek	W. Va.	1	3,310	220		985	100					79,200	
Mate Creek	W. Va.	1	1,480	105	1,030	2,570	70					50,000	900
Big Creek	W. Va.	1	340	65		2,125	50				1,040	39,600	
Upper Buckhannon R.	W. Va.	1	715	75		575	50					52,800	
Total		24	73,755	8,515	14,000	89,195	5,784				34,760	1,491,690	6,550
WATER SUB-REGION H													
Hanging Fork Creek	Ky.	1	6,240	550		2,355	260					15,000	
Silver Creek	Ky.	1	1,030	260		320	55				2,550	20,000	
Upper Red River	Ky.	2	1,275	300	200	220	50				4,370	15,000	300
Total		4	8,545	1,110	200	2,895	365				6,920	50,000	300
WATER SUB-REGION I													
Casey Creek	Ky.	1	1,785	130		315	65				6,595	18,000	
Marrowbone Creek	Ky.	2	890	110	190	475	50					20,000	
Richland Creek	Ky.	1	790	175		180	50				2,095	20,000	
Russell Creek	Ky.	3	22,203	1,855	1,000	1,331	185				12,970	40,000	3,000
Calfkiller River	Tenn.	3	22,070	2,000	3,500	5,860	880				3,790	100,000	5,000
Putnam-Cane Cr.	Tenn.	1	550	100		190	65					32,500	
Salt Lick Creek	Tenn.	2	4,470	460	2,200	1,450	250				2,400	37,000	
Total		13	52,758	4,830	6,890	9,801	1,545				27,850	267,500	8,000
WATER SUB-REGION J													
Cypress Creek	Ala.	3	5,920	605	500	400	80		250		1,540	12,000	3,700
Limestone Creek	Ala.	1	2,310	370	2,200								2,800
Headwaters Chattooga R.	Ga.	2	8,470	995	4,200	935	225					25,000	15,000
Peavine Creek	Ga.	2	5,375	135	370	365	50				630	28,400	17,000
Tallulah Creek 3/	N. C.	1	894	18	160								3,000
Bent Creek	Tenn.	1	620	105	940								682
Blackwater Creek	Tenn.	1	3,330	220		530	90					10,500	

TABLE XLI - B (continued)

Upstream Watersheds - Potential - Water Resource Survey 1/ - Multiple-Purpose Structures

Watershed Name	State	No. of Structures	STORAGE VOLUME AND SURFACE AREA BY PURPOSE: Flood Prevention		M & I Water Supply	Recreation		Fish & Wildlife	Irrigation	Water Quality	Additional Beneficial Storage	Estimated Recreation Days Provided	Population Served by Water Supply
		(No.)	(Ac. Ft.)	(Acres) 2/	(Ac. Ft.)	(Ac. Ft.)	(Acres)	(Ac. Ft.)	(Ac. Ft.)	(Ac. Ft.)	(Ac. Ft.)		
WATER SUB-REGION J (continued)													
Bull Run Creek	Tenn.	1	5,850	275		2,550	190					31,000	
Coahulla Creek	Tenn.	3	3,765	860	2,450	100	68	415			2,350	30,000	18,000
Perkins Creek	Tenn.	2	2,095	158	500	500	50					11,400	2,200
Headwaters Clinch R.	Va.	1	1,720	90	800								6,000
Indian Creek	Va.	2	1,090	135	350	1,600	55				770	25,000	500
Martin Creek	Va.	2	1,185	140		850	50			360	1,220	25,000	
Total		22	42,624	4,106	12,470	7,830	858	415	250	360	6,510	198,300	68,882
Grand Total		159	394,794	45,855	119,160	298,126	20,971	4,415	3,505	13,935	191,500	9,262,440	430,157

1/ As of October 1967.
2/ Emergency spillway crest.
3/ The U. S. Forest Service will make a detailed study and appraisal to supplement the proposed project before authorization for detailed planning is initiated.

TABLE XLI-B(1)

Summary - Upstream Watersheds - Potential - Water Resource Survey 1/ - Multiple-Purpose Structures

Sub-Region	Number of Structures	STORAGE VOLUME AND SURFACE AREA BY PURPOSE								Additional Beneficial Storage	Estimated Recreation Days Provided	Population Served by Water Supply
		Flood Prevention		M & I Water Supply	Recreation		Fish & Wildlife	Irrigation	Water Quality			
	(No.)	(Ac.Ft.)	(Acres) 2/	(Ac.Ft.)	(Ac.Ft.)	(Acres)	(Ac.Ft.)	(Ac.Ft.)	(Ac.Ft.)	(Ac.Ft.)		
A	None											
B	8	21,865	2,582	1,535	38,290	1,598	4,000			11,000	462,800	1,124
C	None											
D	21	49,025	4,915	16,185	5,305	830		3,255	13,575	14,610	248,600	124,860
E	12	24,682	3,095	3,300	6,555	741				3,895	88,650	19,600
F	55	121,540	16,702	64,580	138,255	9,250				85,955	6,454,900	203,841
G	24	73,755	8,515	14,000	89,195	5,784				34,760	1,491,690	6,550
H	.4	8,545	1,110	200	2,895	365				6,920	50,000	300
I	13	52,758	4,830	6,890	9,801	1,545				27,850	267,500	8,000
J	22	42,624	4,106	12,470	7,830	858	415	250	360	6,510	198,300	68,882
Total	159	394,794	45,855	119,160	298,126	20,971	4,415	3,505	13,935	191,500	9,262,440	430,157

1/ As of October 1967.
2/ To crest of emergency spillway.

TABLE XLI- C

Upstream Watersheds - Potential - Water Resource Survey 1/ - Average Annual Flood Damages (dollars)

Watershed Name	State	Crop & Pasture	Other Agriculture	Residential & Commercial	Road & Bridge	Railroad	Sediment & Erosion	Indirect	Total
WATER SUB-REGION A									
None									
WATER SUB-REGION B									
Georges Creek	Md.			15,800	14,000			5,900	35,700
Little Beaver Creek	Md.	280	164	90	24			84	642
Upper Casselman River	Md.	2,400		109,100	12,850			25,100	149,450
Cayuga Inlet	N. Y.	7,050	1,290	26,000 *	3,000		78,000	18,730	134,070
West Branch Delaware R.	N. Y.	30,000	15,000	35,000	10,000		18,000	12,500	120,500
Stony Creek	Pa.	25	27,050	24,425	3,600	159,300		43,000	257,400
Wills Creek	Pa.	530	20	25,000	4,400	67,400	3,300	22,750	123,400
Total		40,285	43,524	235,415	47,874	226,700	99,300	128,064	821,162
* $7,000 state park damages									
WATER SUB-REGION C									
None									
WATER SUB-REGION D									
North & Middle Tyger River	S. C.	6,400			1,500		19,700	2,200	29,800
North Oconee River	Ga.	45,600	3,400		2,400		2,800	5,400	59,600
Hunting Bear Creek	N. C.	82,900	5,200		24,000		14,100	12,600	138,800
Upper South Yadkin River	N. C.	6,400	1,400					850	8,650
Cherokee Creek	S. C.	Minor			300		4,500	480	5,280
Eighteen Mile Creek	S. C.	6,500			1,000		16,200	2,400	26,100
South Pacolet River	S. C.	4,500			1,000		10,800	1,600	17,900
Total		152,300	10,000		30,200		68,100	25,530	286,130
WATER SUB-REGION E									
Dyne Creek	Ala.	6,300	4,100		2,400			1,300	14,100
Sipsey Creek	Ala.	156,200	3,000		12,200			18,400	189,800
Jacks and Socapatoy Creek	Ala.	----------	----------	Damages Not Evaluated	----------	----------	----------	----------	----------
Little Sandy Creek	Ala.	800	600	600	600			400	3,000
Luxapalila Creek	Ala.	24,100	6,300		3,900		6,900	3,200	44,400
Mahan Creek	Ala.	5,200	2,400		1,900			1,200	10,700
Mill Creek	Ala.	16,900	7,900		3,300			3,100	31,200
Wehadkee Creek	Ala.	5,300	1,300	600	600			900	8,700

TABLE XLI - C (continued)

Upstream Watersheds - Potential - Water Resource Survey 1/ - Average Annual Flood Damages (dollars)

Watershed Name	State	Crop & Pasture	Other Agriculture	Residential & Commercial	Road & Bridge	Railroad	Sediment & Erosion	Indirect	Total
WATER SUB-REGION E (continued)									
Mill Creek Area	Ga.	25,000			300		2,200	2,800	30,300
Wahoo-Little River	Ga.	26,900			1,000			1,200	29,100
Young Cane Creek	Ga.	14,400	1,300		1,600		1,500	1,900	20,700
Total		281,100	26,900	1,200	27,800		10,600	34,400	382,000
WATER SUB-REGION F									
Great Valley	N. Y.	5,600	2,400	32,250	15,000		5,000	8,650	68,900
Little Valley	N. Y.	3,400	1,000	9,200	1,200			2,000	16,800
Blacklick Creek	Pa.	Minor	Minor	29,500	4,800	14,600	Minor	9,800	58,700
Brokenstraw Creek	Pa.	9,000	2,600	28,200	13,600	3,400	7,700	9,000	73,500
Conoquenessing Creek	Pa.	1,100	900	311,000	7,100	400	700	61,200	382,400
French Creek (Upper)	Pa.	Minor	Minor	5,400	7,000		Minor	2,600	15,000
Indian Creek	Pa.	Minor	Minor	11,900	3,900	1,800	Minor	3,400	21,000
LeBoeuf Creek	Pa.	Minor	Minor	2,000	1,800	400	Minor	800	5,000
Mahoning Creek	Pa.	1,700	800	11,600	3,100	900	400	3,500	22,000
Oswago Creek	Pa.	2,400	500	900	500		900	800	6,000
Potato Creek	Pa.	Minor	Minor	3,000	700	100	Minor	800	4,600
Raccoon Creek	Pa.	Minor	Minor	4,600	3,500		Minor	1,600	9,700
Sandy Lick Creek	Pa.	Minor	Minor	1,100	1,100	300	Minor	500	3,000
Sewickley Creek	Pa.	Minor	Minor	187,200	4,100	1,000	Minor	38,400	230,700
Sugar Creek	Pa.	300	2,000	2,800	5,500		800	1,700	13,100
Tionesta Creek	Pa.	Minor	Minor	57,100	6,500	500	Minor	12,900	77,000
Turtle Creek	Pa.	Minor	Minor	9,800	700	100	Minor	2,100	12,700
Upper Allegheny River	Pa.	2,200	1,500	18,200	1,400	3,200	1,300	3,300	31,100
Upper Loyalhanna Creek	Pa.	Minor	Minor	36,600	1,100			7,600	45,300
West Branch Clarion River	Pa.	Minor	Minor	820	60	50	Minor	190	1,120
Elk Creek	W. Va.		1,000	145,300	1,200			14,700	162,200
Kings Creek	W. Va.			22,800	4,000			2,700	29,500
Limestone Run	W. Va.			20,400	300			2,100	22,800
Paw Paw Creek	W. Va.			24,600	10,500			7,000	42,100
Prickett Creek	W. Va.	900		13,000	1,200			1,500	16,600
Sandy Creek	W. Va.	2,800		10,200	400			1,300	14,700
Simpson Creek	W. Va.	1,800	500	69,200	5,000			7,600	84,100
Three Fork Creek	W. Va.	2,200		44,230	21,540			6,800	74,770
Upper Middle Island Creek	W. Va.	3,600		65,000	55,400			12,400	136,400
Upper West Fork River	W. Va.	850		1,900	900			360	4,010
Total		37,850	13,200	1,179,800	183,100	26,750	16,800	227,300	1,684,800

TABLE XLI - C (continued)

Upstream Watersheds - Potential - Water Resource Survey 1/ - Average Annual Flood Damages (dollars)

Watershed Name	State	Crop & Pasture	Other Agriculture	Residential & Commercial	Road & Bridge	Railroad	Sediment & Erosion	Indirect	Total
WATER SUB-REGION G									
East Fork Little Sandy	Ky.	24,400	4,300	12,900	1,400			4,300	47,300
Triplett Creek	Ky.	29,800	6,000	1,300	2,000			4,100	43,200
Upper Licking River	Ky.	---------------- For details, see Interim Survey Report on Upper Licking River Basin ----------------							
Federal Valley	Ohio	31,790	3,900	8,410	12,110			6,650	62,860
Little Salt Creek	Ohio	52,400	6,300	21,500	11,800			10,900	102,900
Little Scioto River	Ohio	19,840	4,060		5,470			3,210	32,580
Moxahala-Jonathan Creek	Ohio	29,300	4,400	57,000	7,200			13,000	110,900
O'Bannon Creek	Ohio	130	100					20	250
Upper White Oak Creek	Ohio	37,000	4,300		2,900			4,600	48,800
Wakatomika Creek	Ohio	56,500	8,300		9,300			7,900	82,000
Wolf Creek	Ohio	32,100	4,000		5,900			4,500	46,500
Headwaters Holston River	Va.	9,600	1,900	20,300	3,800			6,160	41,760
French Creek	W. Va.	700		2,800	2,000			550	6,050
Mate Creek	W. Va.			84,760	5,410			9,020	99,190
Big Creek	W. Va.	5,700		12,000	8,400			2,600	28,700
Upper Buckhannon River	W. Va.	200		61,300	4,000			12,400	77,900
Total		329,460	47,560	282,270	81,690			89,910	830,890
WATER SUB-REGION H									
Hanging Fork Creek	Ky.	2,040	380		680			310	3,410
Silver Creek	Ky.	6,400	820					720	7,940
Upper Red River	Ky.	14,600	4,500	2,000	1,100		2,130	2,330	26,660
Total		23,040	5,700	2,000	1,780		2,130	3,360	38,010
WATER SUB-REGION I									
Casey Creek	Ky.	12,085						1,205	13,290
Marrowbone Creek	Ky.	4,325						430	4,755
Richland Creek	Ky.	1,200	3,200		3,200			1,100	8,700
Russell Creek	Ky.	14,200	2,000	2,000	1,300			2,300	21,800
Calfkiller River	Tenn.	30,000	3,000	20,000	15,000		10,000	12,000	90,000
Putnam-Cane Creek	Tenn.	9,700	600		2,000		900	1,600	14,800
Little Indian Creek and Buffalo Creek	Tenn.	7,000	900		1,000		680	900	10,480
Salt Lick Creek	Tenn.	46,700	4,200	6,000	8,400		3,600	8,800	77,700
Total		125,210	13,900	28,000	30,900		15,180	28,335	241,525

TABLE XLI - C (continued)

Upstream Watersheds - Potential - Water Resource Survey 1/ - Average Annual Flood Damages (dollars)

Watershed Name	State	Crop & Pasture	Other Agriculture	Residential & Commercial	Road & Bridge	Railroad	Sediment & Erosion	Indirect	Total
WATER SUB-REGION J									
Cane Creek	Ala.	8,400	4,400		700			1,400	14,900
Cypress Creek	Ala.	150,400	49,100		14,300		30,900	23,400	268,100
Limestone Creek	Ala.	74,500	23,400		3,900			9,600	111,400
Little Bear Creek	Ala.	10,300	3,200		1,800		1,600	1,600	18,500
Headwaters Chattooga River	Ga.	30,300		27,900	500			5,800	64,500
Peavine Creek	Ga.	6,900		29,100	600		200	3,700	40,500
Tallulah Creek 2/	N. C.	15,500	800	140,000	8,600			16,500	181,400
Bent Creek	Tenn.	15,700	2,600		15,200		2,100	5,200	40,800
Blackwater Creek	Tenn.	31,100	3,000		12,000		7,100	6,200	59,400
Black Wolf Creek	Tenn.	15,800	1,700		4,000		5,700	3,200	30,400
Bull Run Creek	Tenn.	14,675	1,600		16,500		1,600	5,990	40,365
Charles Creek	Tenn.	9,950	1,300	8,000	7,000		1,050	4,400	31,700
Coahulla Creek	Tenn.	19,800	4,000		12,000		1,200	5,000	42,000
Mountain Creek	Tenn.	17,500	900	500	6,700		3,700	2,900	32,200
Perkins Creek	Tenn.	6,000	300		1,000		3,400	1,200	11,900
Copper Creek	Va.	3,900	900	600	5,300			1,750	12,450
Headwaters Clinch River	Va.	2,800	840	23,000	4,500			5,950	37,090
Indian Creek	Va.	1,400	280	2,900	2,700			1,320	8,600
Martin Creek	Va.	1,000	200	1,000	2,500			820	5,520
Total		435,925	98,520	233,000	119,800		58,550	105,930	1,051,725
Grand Total		1,425,170	259,304	1,961,685	523,144	253,450	270,660	642,829	5,336,242

1/ As of October 1967.

2/ The U. S. Forest Service will make a detailed study and appraisal to supplement the proposed project before authorization for detailed planning is initiated.

TABLE XLI-C(1)

Summary - Upstream Watersheds - Potential - Water Resource Survey 1/ - Average Annual Flood Damages (Dollars)

Sub-Region	Crop and Pasture	Other Agriculture	Residential and Commercial	Road and Bridge	Railroad	Sediment and Erosion	Indirect	Total
A	None							
B	40,285	43,524	235,415	47,874	226,700	99,300	128,064	821,162
C	None							
D	152,300	10,000		30,200		68,100	25,530	286,130
E	281,100	26,900	1,200	27,800		10,600	34,400	382,000
F	37,850	13,200	1,179,800	183,100	26,750	16,800	227,300	1,684,800
G	329,460	47,560	282,270	81,690			89,910	830,890
H	23,040	5,700	2,000	1,780		2,130	3,360	38,010
I	125,210	13,900	28,000	30,900		15,180	28,335	241,525
J	435,925	98,520	233,000	119,800		58,550	105,930	1,051,725
Total	1,425,170	259,304	1,961,685	523,144	253,450	270,660	642,829	5,336,242

1/ As of October 1967.

TABLE XLI - D

Upstream Watersheds - Potential - Water Resource Survey 1/ - Average Annual Benefits (dollars)

Watershed Name	State	Damage Reduction	More Intensive Land Use	Changed Land Use	Urban Land Enhancement	Drainage	Irrigation	M & I Water Supply	Recreation	Fish & Wildlife	Secondary	Redevelopment	Incidental Recreation	Water Quality	Total	B/C Ratio 2/
WATER SUB-REGION A																
None																
WATER SUB-REGION B																
Georges Creek	Md.	80,600			1,900						8,900	14,300	500		106,200	1.5:1
Little Beaver Creek	Md.	-----	-----	-----	No information developed	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Upper Casselman R.	Md.	135,200						20,100	100,000	12,100	26,500	13,100			307,000	4.6:1
Cayuga Inlet	N. Y.	84,940									3,720	22,830	21,000		132,490	1.8 1
W. Br. Delaware R.	N. Y.	78,900									8,000	40,000			126,900	0.45:1
Stony Creek	Pa.	181,300							180,000		44,800	79,500			485,600	1.3:1
Wills Creek	Pa.	68,100		5,500				2,900	283,500		40,700	46,500			447,200	2.1:1
Total		629,040		5,500	1,900			23,000	563,500	12,100	132,620	216,230	23,500		1,605,390	
WATER SUB-REGION C																
None																
WATER SUB-REGION D																
N. Oconee River	Ga.	52,000	55,700					19,200			16,100	16,000			159,000	2.1:1
Hunting Bear Creek	N. C.	133,600	35,800	32,900							19,000	45,000	15,400		282,100	1.2:1
U. South Yadkin R.	N. C.	7,150	2,640					8,530	27,000		4,460	8,910			58,690	1.2:1
Cherokee Creek	S. C.	3,900						12,000			1,600	2,400	16,200		36,100	2.8:1
Eighteen Mile Cr.	S. C.	20,900	8,100					5,000	69,100		12,500	15,500	11,300		142,400	1.6:1
N. and Middle Tyger	S. C.	25,600	6,800				11,300	16,000	94,800		22,000	34,100	12,700	24,100	247,400	1.2:1
South Pacolet River	S. C.	13,700	12,900				5,000	26,900	112,800		20,400	24,200	10,900		226,800	1.8:1
Total		256,850	121,940	32,900			16,300	87,630	303,700		96,060	146,510	66,500	24,100	1,152,490	
WATER SUB-REGION E																
Dyne Creek	Ala.	12,000	1,500								4,100	3,100	2,000		22,700	1.5:1
Sipsey Creek	Ala.	101,200	19,500	44,600							29,400	47,600	30,200		272,500	1.2:1
Jacks & Socapotay Cr.	Ala.								36,100			4,900			41,000	1.7:1
Little Sandy Creek	Ala.	2,500							26,000		1,000	5,000			34,500	1.2:1
Luxapalila Creek	Ala.	31,300	95,000					16,000	11,500		31,900	38,400	23,500		247,600	1.3:1
Mahan Creek	Ala.	9,000	1,000						10,600		2,300	4,100	500		27,500	1.3:1
Mill Creek	Ala.	23,800	3,900								5,900	6,500	2,600		42,700	1.2:1

TABLE XLI - D (continued)

Upstream Watersheds - Potential - Water Resource Survey 1/ - Average Annual Benefits (dollars)

Watershed Name	State	Damage Reduction	More Intensive Land Use	Changed Land Use	Urban Land Enhancement	Drainage	Irrigation	M & I Water Supply	Recreation	Fish & Wildlife	Secondary	Redevelopment	Incidental Recreation	Water Quality	Total	B/C Ratio 2/
WATER SUB-REGION E (continued)																
Wehadkee Creek	Ala.	6,800	1,900	2,000							2,900	3,200	1,900		18,700	1.2:1
Mill Creek Area	Ga.	25,400	14,200								4,800	7,300			51,700	1.5:1
Wahoo-Little River	Ga.	22,400						400			2,200	3,900	3,200		32,100	1.3:1
Young Cane Creek	Ga.	16,800	10,100								3,100	5,500			35,500	1.3:1
Total		251,200	147,100	46,600				16,400	84,200		87,600	129,500	63,900		826,500	
WATER SUB-REGION F																
Great Valley	N.Y.	62,450		14,000							6,850	15,220			98,520	1.0:1
Little Valley	N.Y.	8,370							10,000		730	3,280			22,380	1.2:1
Blacklick Creek	Pa.	9,600							189,000		24,200	43,400			266,200	1.2:1
Brokenstraw Creek	Pa.	39,500							713,200		78,800	34,600			866,100	2.9:1
Conoquenessing Cr.	Pa.	228,900						109,900	598,600		103,600	98,700			1,139,700	1.9:1
French Creek (Upper)	Pa.	13,900						56,400	944,900		108,700	71,700			1,195,600	2.8:1
Indian Creek	Pa.	19,000						43,900	126,000		20,000	11,500			220,400	1.2:1
Le Boeuf Creek	Pa.	2,800						21,300	415,800		48,600	46,400			534,900	2.5:1
Mahoning Creek	Pa.	14,100							367,500		43,100	49,600			474,300	1.7:1
Oswago Creek	Pa.	1,400							506,400		56,100	53,100			617,000	2.1:1
Potato Creek	Pa.	1,500							105,000		14,000	33,000			153,500	1.0:1
Raccoon Creek	Pa.	1,900						20,000	105,000		14,000	13,400			154,300	1.9:1
Sandy Lick Creek	Pa.	400						66,300	210,000		31,300	36,500			344,500	1.5:1
Sewickley Creek	Pa.	259,500 3/						18,300			31,200	34,300			343,300	2.1:1
Sugar Creek	Pa.	9,500							1,365,000		143,100	56,400			1,574,000	3.1:1
Tionesta Creek	Pa.	26,500							385,000		48,200	70,200			529,900	2.9:1
Turtle Creek	Pa.	200						28,600	234,400		29,000	26,600			318,800	2.0:1
U. Alleghany River	Pa.	21,100							186,400		26,400	56,100			290,000	1.1:1
U. Loyalhanna Cr.	Pa.	35,300						11,400	567,000		66,900	55,800			736,400	2.1:1
W. Br. Clarion R.	Pa.	600						26,200	701,400		78,000	51,000			857,200	3.5:1
Elk Creek	W. Va.	135,800							113,000		12,900	31,800			293,500	2.0:1
Kings Creek	W. Va.	24,800							55,400		2,400	10,300			92,900	2.0:1
Limestone Run	W. Va.	15,100							51,600		6,600	6,700			80,000	1.8:1
Paw Paw Creek	W. Va.	27,200							22,700		5,100	11,100			71,400	1.1:1
Prickett Creek	W. Va.	12,460						5,300	28,700		1,200	4,900			47,260	1.7:1
Sandy Creek	W. Va.	11,600							51,600		6,000	17,500			86,700	1.1:1
Simpson Creek	W. Va.	66,600						10,600	25,500		10,500	14,800			128,000	1.4:1
Three Fork Creek	W. Va.	63,700							68,600		12,900	20,400			165,600	1.8:1
U. Middle Island Cr.	W. Va.	98,200							51,000		14,900	44,000			208,100	1.2:1
U. West Fork R.	W. Va.	3,820									360	10,600			14,780	0.3:1
Total		1,215,800		14,000				418,200	8,198,700		1,045,640	1,032,900			11,925,240	

TABLE XLI - D (continued)

Upstream Watersheds - Potential - Water Resource Survey 1/ - Average Annual Benefits (dollars)

Watershed Name	State	Damage Reduction	More Intensive Land Use	Changed Land Use	Urban Land Enhancement	Drainage	Irrigation	M & I Water Supply	Recreation	Fish & Wildlife	Secondary	Redevelopment	Incidental Recreation	Water Quality	Total	B/C Ratio 2/
WATER SUB-REGION G																
E. Fork Little Sandy	Ky.	24,600			5,300				30,000		7,900	5,500			73,300	1.3:1
Triplett Creek	Ky.	23,700	11,000						30,000		10,200	22,700			97,600	0.7:1
Upper Licking River	Ky.	For details, see Interim Survey Report on Upper Licking River Basin														
Federal Valley	Ohio	51,180	12,500					1,960	154,770		26,139	46,380			292,920	2.2:1
Little Salt Creek	Ohio	70,300			6,900				18,900		12,700	38,100			146,900	1.2:1
Little Scioto River	Ohio	23,710	15,580						160,660		22,390	26,330			248,670	2.1:1
Moxahala-Jonathan Cr.	Ohio	78,200	6,300					6,100	204,300		32,300	38,200			365,400	2.2:1
O'Bannon Creek	Ohio	250	100						49,810		7,220	22,040			79,420	0.9:1
U. White Oak Creek	Ohio	32,200	10,900						122,400		18,500	22,800			206,800	1.8:1
Wakatomika Creek	Ohio	52,900	17,700						190,900		30,600	49,600			341,700	1.7:1
Wolf Creek	Ohio	26,300	7,800					1,900	333,900		43,200	63,200			476,300	2.0:1
Headwaters Holston R.	Va.	33,600			7,900			35,000	300,000		37,200	49,000	9,200		471,900	2.1:1
French Creek	W. Va.	4,620							87,900		440	14,000			106,960	1.5:1
Mate Creek	W. Va.	64,000						10,820	50,000		6,100	19,300			150,220	1.6:1
Big Creek	W. Va.	19,800							51,000		7,100	14,800			92,700	1.7:1
U. Buckhannon R.	W. Va.	63,700							68,700		13,200	37,300			182,900	1.1:1
Total		569,060	81,880		20,100			55,780	1,853,240		275,180	469,250	9,200		3,333,690	1.1:1
WATER SUB-REGION H																
Hanging Fork Creek	Ky.	2,600	4,100						22,500		4,800	8,800			42,800	0.9:1
Silver Creek	Ky.	6,980	11,300						30,000		6,740	6,230			61,250	1.2:1
Upper Red River	Ky.	13,100	2,100					2,500	22,500		5,300	5,500			51,000	1.0:1
Total		22,680	17,500					2,500	75,000		16,840	20,530			155,050	
WATER SUB-REGION I																
Casey Creek	Ky.	10,530		9,900					48,700		5,000	9,350			83,480	1.6:1
Marrowbone Creek	Ky.	4,400	3,700					4,100	30,000		6,200	8,200			56,600	1.0:1
Richland Creek	Ky.	7,600	21,600						30,000		9,500	11,500			80,200	1.1:1
Russell Creek	Ky.	19,300	10,900					4,900	60,000		13,500	21,100			129,700	1.0:1
Calfkiller River	Tenn.	72,000						50,000	125,600		27,300	35,400			310,300	1.7:1
Putnam-Cane Cr.	Tenn.	12,000	9,400						48,700		4,400	4,200			78,700	3.3:1
L. Indian Cr. & Buffalo Creek	Tenn.	8,908	575								765	9,587			19,835	0.4:1
Salt Lick Creek	Tenn.	58,300						15,000	50,000		12,300	21,800			157,400	1.3:1
Total		193,038	46,175	9,900				74,000	393,000		78,965	121,137			916,215	

TABLE XLI - D (continued)

Upstream Watersheds - Potential - Water Resource Survey 1/ - Average Annual Benefits (dollars)

Watershed Name	State	Damage Reduction	More Intensive Land Use	Changed Land Use	Urban Land Enhancement	Drainage	Irrigation	M & I Water Supply	Recreation	Fish & Wildlife	Secondary	Redevelopment	Incidental Recreation	Water Quality	Total	B/C Ratio 2/
WATER SUB-REGION J																
Cane Creek	Ala.	10,500	1,800								3,100	2,300	1,300		19,000	1.6:1
Cypress Creek	Ala.	187,700	18,600				2,600	2,500	11,300		39,900	34,700	17,000		314,300	1.7:1
Limestone Creek	Ala.	77,900	9,000					11,000			18,800	18,800	12,500		148,000	1.5:1
Little Bear Creek	Ala.	15,300	1,700								2,300	3,900	400		23,600	1.2:1
Headwaters Chattooga	Ga.	49,900	48,000					33,200	37,500		11,300	20,100			200,000	1.3:1
Peavine Creek	Ga.	32,800	10,500		5,800			2,000	42,500		6,800	10,600	3,500		114,500	1.5:1
Tallulah Creek 4/	N.C.	89,700	4,800		6,500			4,200			12,300	22,500	3,200		143,200	1.3:1
Bent Creek	Tenn.	33,500	11,100					5,650			5,500	7,600	8,700		72,050	1.4:1
Blackwater Creek	Tenn.	47,900							14,400		6,800	11,000			80,100	1.3:1
Black Wolf Creek	Tenn.	24,300									2,900	5,000	2,500		34,700	1.5:1
Bull Run Creek	Tenn.	29,500	10,800						31,000		7,100	13,100			91,500	1.4:1
Charles Creek	Tenn.	28,150	4,180			340					3,830	4,330	5,600		46,430	1.8:1
Coahulla Creek	Tenn.	34,800	11,000					8,400	39,000		10,300	13,700			117,200	1.5:1
Mountain Creek	Tenn.	27,500									3,600	3,800	7,300		42,200	1.5:1
Perkins Creek	Tenn.	9,500						2,320	17,110		3,480	5,840			38,250	1.1:1
Copper Creek	Va.	9,400									800	17,200	2,200		29,600	0.4:1
Headwaters Clinch R.	Va.	32,800						3,200			3,200	19,500	4,800		63,500	0.7:1
Indian Creek	Va.	5,100						3,500	37,500		1,200	17,900	900		66,100	0.8:1
Martin Creek	Va.	4,400							37,500		1,200	3,200		3,500	49,800	2.1:1
Total		750,650	131,480		12,300	340	2,600	75,970	267,810		144,410	235,070	69,900	3,500	1,694,030	
Grand Total		3,888,318	546,075	108,900	34,300	340	18,900	753,480	11,739,150	12,100	1,877,315	2,371,127	231,000	27,600	21,608,605	

1/ As of October 1967.
2/ Feasible project if B/C ratio is 0.8:1 or greater.
3/ Includes other than flood damage reduction benefits.
Data were not available for complete breakdown.
4/ The U. S. Forest Service will make a detailed study and appraisal to supplement the proposed project before authorization for detailed planning is initiated.

TABLE XLI-D(1)

Summary - Upstream Watersheds - Potential - Water Resource Survey 1/ - Average Annual Benefits (Dollars)

Sub-Region	Damage Reduction	More Intensive Land Use	Changed Land Use	Urban Land Enhancement	Drainage	Irrigation	M & I Water Supply	Recreation	Fish & Wild-life	Secondary	Redevelop-ment	Incidental Recreation	Water Quality	Total
A	None													
B	629,040		5,500	1,900			23,000	563,500	12,100	132,620	216,230	23,500		1,605,390
C	None													
D	256,850	121,940	32,900			16,300	87,630	303,700		96,060	146,510	66,500	24,100	1,152,490
E	251,200	147,100	46,600				16,400	84,200		87,600	129,500	63,900		826,500
F	1,215,800		14,000				418,200	8,198,700		1,045,640	1,032,900			11,925,240
G	569,060	81,880		20,100			55,780	1,853,240		275,180	469,250	9,200		3,333,690
H	22,680	17,500					2,500	75,000		16,840	20,530			155,050
I	193,038	46,175	9,900				74,000	393,000		78,965	121,137			916,215
J	750,650	131,480		12,300	340	2,600	75,970	267,810		144,410	235,070	69,900	3,500	1,694,030
Total	3,888,318	546,075	108,900	34,300	340	18,900	753,480	11,739,150	12,100	1,877,315	2,371,127	231,000	27,600	21,608,605

1/ As of October 1967.

TABLE XLI - E

Upstream Watersheds - Potential - Water Resource Survey 1/ - Average Annual Benefits Including Expansion Benefits (dollars)

Watershed Name	State	USER BENEFITS										NATIONAL EXPANSION BENEFITS		Total	B/C Ratio 2/
		Flood Preven-tion	Land Enhancement		Recrea-tion	Inci-dental Recrea-tion	Fish & Wild-life	M & I Water Supply	Water Quality Manage-ment	Drainage*	Redeve-lopment	Develop-ment	Agr. Enhance-ment		
			Agri-culture	Urban						Ag. Water Manage-ment (Irrigation)					
WATER SUB-REGION A															
None															
WATER SUB-REGION B															
Georges Creek	Md.	80,600				500					20,400			101,500	1.4:1
Little Beaver Creek	Md.	No data available													
Upper Casselman R.	Md.	135,200			100,000		12,100	20,100			17,400			284,800	4.21
Cayuga Inlet	N.Y.	84,940				21,000					13,900			119,840	1.5:1
W. Br. Delaware R.	N.Y.	78,900									49,000			127,900	0.45:1
Stony Creek	Pa.	181,300		5,200	180,000						123,200	1,571,700		2,061,400	2.2:1
Wills Creek	Pa.	68,100		15,700	283,500			2,900			72,700	2,446,100	8,300	2,897,300	2.4:1
Total		629,040		20,900	563,500	21,500	12,100	23,000			296,600	4,017,800	8,300	5,592,740	
WATER SUB-REGION C															
None															
WATER SUB-REGION D															
N. Oconee River	Ga.	52,000	55,700					19,200			33,000		69,600	229,500	3.0:1
Hunting Bear Creek	N.C.	133,600	68,700			15,400					56,500		59,800	334,000	1.5:1
U. South Yadkin	N.C.	7,100	2,600		27,000			8,500			9,700		1,700	56,600	1.1:1
Cherokee Creek	S.C.	3,900				16,200		12,000			3,000			35,100	2.8:1
Eighteen Mile Creek	S.C.	20,900	8,100		69,100	11,300		5,000			18,500		7,300	140,200	1.6:1
N. & Middle Tyger R.	S.C.	25,600	6,800		94,800	12,700		16,000	24,100	11,300	50,800		7,000	249,100	1.3:1
S. Pacolet River	S.C.	13,700	12,900		112,800	10,900		26,900		5,000	31,000		36,300	249,500	2.0:1
Total		256,800	154,800		303,700	66,500		87,600	24,100	16,300	202,500		181,700	1,294,000	

TABLE XLI - E (continued)

Upstream Watersheds - Potential - Water Resource Survey 1/ - Average Annual Benefits Including Expansion Benefits (dollars)

Watershed Name	State	USER BENEFITS: Flood Prevention	USER BENEFITS: Land Enhancement: Agriculture	USER BENEFITS: Land Enhancement: Urban	USER BENEFITS: Recreation	USER BENEFITS: Incidental Recreation	USER BENEFITS: Fish & Wildlife	USER BENEFITS: M & I Water Supply	USER BENEFITS: Water Quality Management	USER BENEFITS: Drainage* Ag. Water Management (Irrigation)	USER BENEFITS: Redevelopment	NATIONAL EXPANSION BENEFITS: Development	NATIONAL EXPANSION BENEFITS: Agr. Enhancement	Total	B/C Ratio 2/
WATER SUB-REGION E															
Dyne Creek	Ala.	12,000	1,500			2,000					3,700		1,200	20,400	1.4:1
Sipsey Creek	Ala.	101,200	64,100			30,200					53,400		44,200	293,100	1.3:1
Jacks & Socapotay Cr.	Ala.				36,100						6,300			42,400	1.8:1
Little Sandy Creek	Ala.	2,500			26,000						8,500			37,000	1.3:1
Luxapalila Creek	Ala.	31,300	95,000		11,500	23,500		16,000			43,400		76,900	297,600	1.6:1
Mahan Creek	Ala.	9,000	1,000		10,600	500					4,300		900	26,300	1.3:1
Mill Creek	Ala.	23,800	3,900			2,600					6,800			39,400	1.2:1
Wehadkee Creek	Ala.	6,800	3,900			1,900					3,400			18,400	1.2:1
Mill Creek Area	Ga.	25,400	14,200								6,200		8,800	54,600	1.6:1
Wahoo-Little River	Ga.	22,400				3,200		400			5,800			31,800	1.3:1
Young Cane Creek	Ga.	16,800	10,100								6,800		5,300	39,000	1.3:1
Total		251,200	193,700		84,200	63,900		16,400			148,600		142,000	900,000	
WATER SUB-REGION F															
Great Valley	N.Y.	62,500	14,000								23,900			100,400	1.1:1
Little Valley	N.Y.	8,400			10,000						5,100			23,500	1.2:1
Blacklick Creek	Pa.	9,600		13,100	189,000						75,800	3,032,400		3,319,900	2.3:1
Brokenstraw Creek	Pa.	39,500			713,200						62,600			815,300	2.8:1
Connoquenessing Cr.	Pa.	228,900		15,700	598,600			109,900			148,000	2,314,300		3,415,400	2.2:1
French Creek (Upper)	Pa.	13,900		7,900	944,900			56,400			100,200	3,775,000		4,898,300	4.0:1
Indian Creek	Pa.	19,000			126,000			43,900			39,200			298,100	1.3:1
LeBoeuf Creek	Pa.	2,800			415,800			21,300			58,000			497,900	2.3:1
Mahoning Creek	Pa.	14,100			367,500						77,600			459,200	1.7:1
Oswago Creek	Pa.	1,400			506,400						81,500			589,300	2.1:1
Potato Creek	Pa.	1,500			105,000						39,100			145,600	0.97:1
Raccoon Creek	Pa.	1,900			105,000			20,000			18,500			145,400	1.8:1
Sandy Lick Creek	Pa.	400			210,000			66,300			47,400			324,100	1.5:1
Sewickley Creek	Pa.	259,500		2,600				18,300			41,300	1,229,200		1,550,900	3.5:1
Sugar Creek	Pa.	9,500			1,365,000						117,200			1,491,700	2.9:1
Tionesta Creek	Pa.	26,500			385,000						50,900			462,400	2.8:1
Turtle Creek	Pa.	200			234,400			28,600			43,300			306,500	1.9:1
U. Allegheny River	Pa.	21,100			186,400						66,100			273,600	1.0:1
U. Loyalhanna Creek	Pa.	35,300			567,000			11,400			66,300			680,000	2.0:1
W. Br. Clarion R.	Pa.	600			701,400			26,200			56,300			784,500	3.4:1
Elk Creek	W. Va.	135,800		5,200	113,000						446,200	1,242,200		1,942,400	3.0:1
Kings Creek	W. Va.	24,800		2,600	55,400						10,300	628,500		721,600	2.2:1
Limestone Run	W. Va.	14,800		1,700	51,600						10,300	660,400		738,800	2.7:1
Paw Paw Creek	W. Va.	27,200			22,700			5,300			14,300			69,500	1.1:1

TABLE XLI - E (continued)

Upstream Watersheds - Potential - Water Resource Survey 1/ - Average Annual Benefits Including Expansion Benefits (dollars)

Watershed Name	State	USER BENEFITS: Flood Prevention	Land Enhancement: Agriculture	Land Enhancement: Urban	Recreation	Incidental Recreation	Fish & Wildlife	M & I Water Supply	Water Quality Management	Drainage* Ag. Water Management (Irrigation)	Redevelopment	NATIONAL EXPANSION BENEFITS: Development	Agr. Enhancement	Total	B/C Ratio 2/
WATER SUB-REGION F (continued)															
Prickett Creek	W. Va.	12,500		2,600	28,700						7,400	766,100		817,300	2.7:1
Sandy Creek	W. Va.	11,600			51,600						25,800			89,000	1.1:1
Simpson Creek	W. Va.	66,600		2,300	25,500			10,600			23,900	588,100		717,000	2.1:1
Three Fork Creek	W. Va.	63,700		2,600	68,600						24,900	749,000		908,800	2.5:1
U. Middle Island Cr.	W. Va.	98,200		5,200	51,000						17,600	1,189,700		1,361,700	2.1:1
U. West Fork River	W. Va.	3,800									14,200			18,000	0.4:1
Total		1,215,600	14,000	61,500	8,198,700			418,200			1,813,200	16,174,900		27,896,100	
WATER SUB-REGION G															
E. Fr. Little Sandy	Ky.	24,600		5,300	30,000						6,700		4,600	71,200	1.3:1
Triplett Creek	Ky.	23,700	11,000		30,000						35,100		14,200	114,000	0.8:1
Upper Licking River	Ky.	For details, see Survey Interim Report on Upper Licking River Basin													
Federal Valley	Ohio	51,200	12,500	11,800	154,800			2,000			30,000	1,649,700	14,300	1,926,300	2.4:1
Little Salt Creek	Ohio	78,200		6,900	18,900						30,200	1,978,100		2,112,300	2.6:1
Little Scioto River	Ohio	23,700	15,600		160,700						23,700		15,900	239,600	2.0:1
Moxahala-Jonathan Cr.	Ohio	78,200	5,100		204,300			6,100			36,400		5,900	336,000	2.0:1
O'Bannon Creek	Ohio	300	100		49,800						20,900		100	71,200	0.8:1
U. White Oak Creek	Ohio	32,200	10,900		122,400						20,200		11,100	196,800	1.7:1
Wakatomika Creek	Ohio	52,900	17,700		190,900						49,400		20,500	331,400	1.6:1
Wolf Creek	Ohio	26,300	7,800		333,900			1,900			58,200		12,900	441,000	1.9:1
Headwaters Holston R.	Va.	33,600		7,900	300,000	9,200		35,000			63,700			449,400	2.0:1
French Creek	W. Va.	4,600			87,900						16,700			109,200	1.5:1
Mate Creek	W. Va.	64,000		1,000	50,000			10,800			23,000	481,800		630,600	2.7:1
Big Creek	W. Va.	19,800			51,000						12,800			83,600	1.5:1
U. Buckhannon River	W. Va.	63,700		2,600	68,700						50,200	335,400		520,600	1.2:1
Total		577,000	80,700	35,500	1,853,300	9,200		55,800			477,200	4,445,000	99,500	7,633,200	
WATER SUB-REGION H															
Hanging Fork Creek	Ky.	2,600	4,100		22,500						7,500		2,800	39,500	0.9:1
Silver Creek	Ky.	7,000	11,300		30,000						8,900		13,200	70,400	1.4:1
Upper Red River	Ky.	13,100	2,100		22,500			2,500			5,000		900	46,100	0.9:1
Total		22,700	17,500		75,000			2,500			21,400		16,900	156,000	

TABLE XLI - E (continued)

Upstream Watersheds - Potential - Water Resource Survey 1/ - Average Annual Benefits Including Expansion Benefits (dollars)

Watershed Name	State	USER BENEFITS: Flood Prevention	Land Enhancement: Agriculture	Land Enhancement: Urban	Recreation	Incidental Recreation	Fish & Wildlife	M & I Water Supply	Water Quality Management	Drainage *: Ag. Water Management (Irrigation)	Redevelopment Benefits	NATIONAL EXPANSION BENEFITS: Development	NATIONAL EXPANSION BENEFITS: Agr. Enhancement	Total	B/C Ratio 2/
WATER SUB-REGION I															
Casey Creek	Ky.	10,500	9,900		48,700						9,700		5,800	84,600	1.6:1
Marrowbone Creek	Ky.	4,400	3,700		30,000			4,100			8,000		1,800	52,000	0.92:1
Richland Creek	Ky.	7,600	21,600		30,000						13,300		25,100	97,600	1.4:1
Russell Creek	Ky.	19,300	10,900		60,000			4,900			21,900		5,500	122,500	1.0:1
Calfkiller River	Tenn.	72,000			125,600			50,000			51,900			299,500	1.7:1
Putnam-Cane Creek	Tenn.	12,000	9,400		48,700						6,000		11,700	87,800	3.7:1
L. Indian Creek & Buffalo Creek	Tenn.	8,900	600								15,300			24,800	0.54:1
Salt Lick Creek	Tenn.	58,300			50,000			15,000			20,800			144,100	1.2:1
Total		193,000	56,100		393,000			74,000			146,900		49,900	912,900	
WATER SUB-REGION J															
Cane Creek	Ala.	10,500	1,800			1,300					5,200		3,600	22,400	1.9:1
Cypress Creek	Ala.	187,700	18,600		11,300	17,000		2,500		2,600	47,700		20,800	308,200	1.6:1
Limestone Creek	Ala.	77,900	9,000			12,500		11,000			25,400		9,300	145,100	1.5:1
Little Bear Creek	Ala.	15,300	1,700			400					5,200		1,700	24,300	1.2:1
Headwater Chattooga	Ga.	49,900	48,000		37,500			33,200			31,500		49,400	249,500	1.6:1
Peavine Creek	Ga.	32,800	10,500	5,800	42,500	3,500		2,000			20,000		11,900	129,000	1.7:1
Tallulah Creek 3/	N.C.	89,700	4,800	6,500		3,200		4,200			22,100		2,800	133,300	1.1:1
Bent Creek	Tenn.	33,500	11,100			8,700		5,700			13,700		13,200	85,900	1.6:1
Blackwater Creek	Tenn.	47,900			14,400						11,500			73,800	1.2:1
Black Wolf Creek	Tenn.	24,300				2,500					6,100			32,900	1.5:1
Bull Run Creek	Tenn.	29,500	10,800		31,000						20,600		17,200	109,100	1.7:1
Charles Creek	Tenn.	28,200	4,200			5,600				300*	5,500		3,900	47,700	2.0:1
Coahulla Creek	Tenn.	34,800	11,000		39,000			8,400			19,200		11,200	123,600	1.6:1
Mountain Creek	Tenn.	27,500				7,300					6,200			41,000	1.4:1
Perkins Creek	Tenn.	9,500			17,100			2,300			6,900			35,800	1.0:1
Copper Creek	Va.	9,400				2,200					18,600			30,200	0.4:1
Headwaters Clinch R.	Va.	32,800				4,800		3,200			27,000			67,800	0.7:1
Indian Creek	Va.	5,100			37,500	900		3,500			18,100			65,100	0.8:1
Martin Creek	Va.	4,400			37,500				3,500		3,600			49,000	2.0:1
Total		750,700	131,500	12,300	267,800	69,900		76,000	3,500	2,900	314,100		145,000	1,773,700	
Grand Total		3,896,040	648,300	130,200	11,739,200	231,000	12,100	753,500	27,600	19,200	3,420,500	24,637,700	643,300	46,158,640	

1/ As of October 1967.

2/ *Feasible project if B/C ratio is 0.8:1 or greater.*

3/ **The U. S. Forest Service will make a detailed study and appraisal to supplement the proposed project before authorization for detailed planning is initiated.**

TABLE XLI-E(1)

Summary - Upstream Watersheds - Potential - Water Resource Survey 1/ - Average Annual Benefits Including Expansion Benefits (Dollars)

			USER BENEFITS									National Expansion Benefits		
Sub-Region	No. of Water-sheds	Flood Prevention	Agricultural	Urban	Recreation	Incidental Recreation	Fish & Wildlife	M & I Water Supply	Water Quality	Ag. Water Manage. Drainage* Irrigation	Redevelop-ment	Develop-ment	Agr. Enhance-ment	Total
A	None													
B	7	629,040		20,900	563,500	21,500	12,100	23,000			296,600	4,017,800	8,300	5,592,740
C	None													
D	7	256,800	154,800		303,700	66,500		87,600	24,100	16,300	202,500		181,700	1,294,000
E	11	251,200	193,700		84,200	63,900		16,400			148,600		142,000	900,000
F	30	1,215,600	14,000	61,500	8,198,700			418,200			1,813,200	16,174,900		27,896,100
G	15	577,000	80,700	35,500	1,853,300	9,200		55,800			477,200	4,445,000	99,500	7,633,200
H	3	22,700	17,500		75,000			2,500			21,400		16,900	156,000
I	8	193,000	56,100		393,000			74,000			146,900		49,900	912,900
J	19	750,700	131,500	12,300	267,800	69,900		76,000	3,500	2,900*	314,100		145,000	1,773,700
Total	100	3,896,040	648,300	130,200	11,739,200	231,000	12,100	753,500	27,600	19,200	3,420,500	24,637,700	643,300	46,158,640

1/ As of October 1967.

* $300 benefits to drainage.

TABLE XLI-F

Upstream Watersheds - Potential - Water Resource Survey 1/ - Cost Allocation ($1,000)

No.	Watershed Name	State	Flood Prevention	M & I Water Supply	Recreation	Basic Facilities	Irrigation	Fish and Wildlife	Drainage	Water Quality Management	Total
	WATER SUB-REGION A		None								
	WATER SUB-REGION B										
4	Georges Creek	Md.	2,159.2								2,159.2
5	Little Beaver Creek	Md.									
2	Upper Casselman River	Md.	560.1	580.9	480.0			358.1			1,979.1
20	Cayuga Inlet	N.Y.	2,078.0								2,078.0
25	W. Branch Delaware River	N.Y.	8,210.0								8,210.0
66	Stony Creek	Pa.	4,697.5		1,762.5	1,391.2					7,851.2
73	Wills Creek	Pa.	1,974.1	89.5	2,397.3	660.2					5,121.1
	Total		19,678.9	670.4	4,639.8	2,051.4		358.1			27,398.6
	WATER SUB-REGION C		None								
	WATER SUB-REGION D										
60	North Oconee River	Ga.	1,788.5	183.2							1,971.7
17	Hunting-Bear Creek	N.C.	5,879.0								5,879.0
19	Upper South Yadkin River	N.C.	673.2	258.6	36.7	119.4					1,087.9
19	Cherokee Creek	S.C.	196.1	174.4							370.5
20	Eighteen Mile Creek	S.C.	1,086.3	76.3	56.5	515.1					1,734.2
22	North & Middle Tyger R.	S.C.	2,794.6	150.0	221.6	578.0	178.7				3,922.9
23	South Pacolet River	S.C.	903.4	517.3	39.9	776.5	122.0				2,359.1
	Total		13,321.1	1,359.8	354.7	1,989.0	300.7				17,325.3
	WATER SUB-REGION E										
28	Dyne Creek	Ala.	388.6								388.6
22	Sipsey Creek	Ala.	6,079.6								6,079.6
30	Jacks & Socapotay Creek	Ala.	377.4		241.3	100.0					718.7
33	Little Sandy Creek	Ala.	237.9		419.9	100.0					757.8
34	Luxapalila Creek	Ala.	4,188.4	241.8	106.7	307.0					4,843.9
35	Mahan Creek	Ala.	471.0		14.0	50.0					535.0
38	Mill Creek	Ala.	901.4								901.4
37	Wehadkee Creek	Ala.	397.3								397.3
59	Mill Creek Area	Ga.	613.5								613.5
62	Wahoo-Little River	Ga.	557.0	9.9							566.9
63	Young Cane Creek	Ga.	587.8								587.8
	Total		14,799.9	251.7	781.9	557.0					16,390.5

TABLE XLI-F (continued)

Upstream Watersheds - Potential - Water Resource Survey 1/ - Cost Allocation ($1,000)

No.	Watershed Name	State	Flood Prevention	M & I Water Supply	Recreation	Basic Facilities	Irrigation	Fish and Wildlife	Drainage	Water Quality Management	Total
	WATER SUB-REGION F										
13	Great Valley	N.Y.	2,791.1								2,791.1
15	Little Valley	N.Y.	303.8		220.6	28.0					552.4
54	Blacklick Creek	Pa.	2,193.0		2,315.7	577.0					5,085.7
55	Brokenstraw Creek	Pa.	2,405.5		1,200.8	2,181.4					5,787.7
25	Connoquenessing Creek	Pa.	7,011.8	2,938.3	2,454.8	2,232.4					14,637.3
56	French Creek (Upper)	Pa.	2,278.2	1,434.5	1,322.0	3,064.6					8,099.3
57	Indian Creek	Pa.	2,268.0	1,123.4	748.2	461.0					4,600.6
58	LeBoeuf Creek	Pa.	317.0	542.0	297.0	2,962.0					4,118.0
59	Mahoning Creek	Pa.	2,101.0		1,830.5	1,073.5					5,005.0
60	Oswago Creek	Pa.	1,025.6		1,735.0	2,201.9					4,962.5
61	Potato Creek	Pa.	2,056.0		1,581.2	343.0					3,980.2
62	Raccoon Creek	Pa.	540.3	534.6	617.2	229.7					1,921.8
63	Sandy Lick Creek	Pa.	1,093.1	1,686.0	2,024.5	798.5					5,602.1
64	Sewickley Creek	Pa.	3,177.7	351.1							3,528.8
67	Sugar Creek	Pa.	611.5		2,180.6	4,791.0					7,583.1
68	Tionesta Creek	Pa.	1,686.7		632.0	1,660.9					3,979.6
69	Turtle Creek	Pa.	691.8	766.6	1,024.5	861.9					3,344.8
70	Upper Allegheny River	Pa.	4,973.6		700.0	689.2					6,362.8
71	Upper Loyalhanna Creek	Pa.	3,512.1	950.3	1,513.5	1,645.5					7,621.4
72	W. Br. Clarion River	Pa.	1,185.3	595.2	1,013.6	1,957.1					4,751.2
79	Elk Creek	W.Va.	3,701.9		158.9	282.1					4,142.9
81	Kings Creek	W.Va.	762.8		202.8	228.9					1,194.5
82	Limestone Run	W.Va.	230.9		492.8	167.0					890.7
84	Paw Paw Creek	W.Va.	1,223.1	160.9	200.7	134.8					1,719.5
85	Prickett Creek	W.Va.	549.1		32.2	119.1					700.4
86	Sandy Creek	W.Va.	1,448.4		475.9	182.9					2,107.2
87	Simpson Creek	W.Va.	1,980.0	232.2	256.5	150.0					2,618.7
88	Three Fork Creek	W.Va.	2,139.8		93.8	282.0					2,515.6
89	U. Middle Island Creek	W.Va.	3,707.2		242.2	175.0					4,124.4
91	U. West Fork River	W.Va.	1,433.8								1,433.8
	Total		59,400.1	11,315.1	25,567.5	29,480.4					125,763.1
	WATER SUB-REGION G										
16	E. Fork Little Sandy	Ky.	1,097.4		249.3	156.7					1,503.4
22	Triplett Creek	Ky.	3,399.5		206.3	114.8					3,720.6
25	Upper Licking Creek	Ky.	----------	----------	----------	----------	----------	----------	----------	----------	----------
9	Federal Valley	Ohio	2,274.2	30.7	506.9	381.1					3,192.9

TABLE XLI-F (continued)

Upstream Watersheds - Potential - Water Resource Survey 1/ - Cost Allocation ($1,000)

No.	Watershed Name	State	Flood Prevention	M & I Water Supply	Recreation	Basic Facilities	Irrigation	Fish and Wildlife	Drainage	Water Quality Management	Total
	WATER SUB-REGION G (continued)										
10	Little Salt Creek	Ohio	2,849.7		419.6						3,269.3
11	Little Scioto River	Ohio	1,821.1		712.6	416.0					2,949.7
12	Moxahala-Jonathan Creek	Ohio	1,881.0	179.0	1,364.0	482.0					3,906.0
13	O'Bannon Creek	Ohio	1,020.0		440.0	513.0					1,973.0
14	Upper White Oak Creek	Ohio	1,362.0		355.0	1,065.0					2,782.0
15	Wakatomika Creek	Ohio	3,012.0		720.0	1,264.0					4,996.0
16	Wolf Creek	Ohio	1,810.0	57.0	980.0	1,872.0					4,719.0
76	Headwaters Holston River	Va.	2,840.5	734.8	751.2	999.5					5,326.0
80	French Creek	W.Va.	1,440.2		107.8	214.7					1,762.7
83	Mate Creek	W.Va.	1,157.9	318.1	943.5	180.2					2,599.7
92	Big Creek	W.Va.	570.5		528.9	175.0					1,274.4
93	U. Buckhannon River	W.Va.	4,417.3		215.3	207.0					4,839.6
	Total		30,953.3	1,319.6	8,500.4	8,041.0					48,814.3
	WATER SUB-REGION H										
17	Hanging Fork Creek	Ky.	775.4		227.2	169.4					1,172.0
21	Silver Creek	Ky.	1,073.0		131.2	114.0					1,318.2
23	Upper Red River	Ky.	824.0	70.6	278.9	101.0					1,274.5
	Total		2,672.4	70.6	637.3	384.4					3,764.7
	WATER SUB-REGION I										
15	Casey Creek	Ky.	1,173.8		77.0	109.4					1,360.2
18	Marrowbone Creek	Ky.	1,223.1	40.1	76.6	111.4					1,451.2
19	Richland Creek	Ky.	1,600.7		113.5	96.0					1,830.2
20	Russell Creek	Ky.	2,573.6	53.2	500.2	217.0					3,344.0
21	Calfkiller River	Tenn.	2,775.6	386.4	640.5	660.5					4,463.0
23	Putnam-Cane Creek	Tenn.	213.5		88.5	211.4					513.4
25	L. Indian & Buffalo Cr.	Tenn.	1,264.4								1,264.4
28	Salt Lick Creek	Tenn.	1,965.5	273.6	194.5	474.5					2,908.1
	Total		12,790.2	753.3	1,710.8	1,880.2					17,134.5
	WATER SUB-REGION J										
26	Cane Creek	Ala.	302.7								302.7
27	Cypress Creek	Ala.	4,780.4	28.8	22.6	154.0	23.3				5,009.1
31	Limestone Creek	Ala.	2,460.1	145.0							2,605.1

TABLE XLI-F (continued)

Upstream Watersheds - Potential - Water Resource Survey 1/ - Cost Allocation ($1,000)

No.	Watershed Name	State	Flood Prevention	M & I Water Supply	Recreation	Basic Facilities	Irrigation	Fish and Wildlife	Drainage	Water Quality Management	Total
	WATER SUB-REGION J (continued)										
32	Little Bear Creek	Ala.	533.5								533.5
58	Headwaters Chattooga River	Ga.	2,964.0	565.2	97.3	153.9					3,780.4
61	Peavine Creek	Ga.	1,428.7	34.8	43.2	186.1					1,692.8
18	Tallulah Creek 2/	N.C.	3,291.8	93.2							3,385.0
17	Bent Creek	Tenn.	1,332.1	134.0							1,466.1
18	Blackwater Creek	Tenn.	1,301.1		69.7	176.4					1,547.2
19	Blackwolf Creek	Tenn.	684.1								684.1
20	Bull Run Creek	Tenn.	1,446.9		160.7	195.7					1,803.3
24	Charles Creek	Tenn.	677.3						2.7		680.0
29	Coahulla Creek	Tenn.	1,029.8	161.2	12.2	428.0		32.0			1,663.2
26	Mountain Creek	Tenn.	769.7								769.7
27	Perkins Creek	Tenn.	118.0								118.0
74	Copper Creek	Va.	2,127.0								2,127.0
75	Headwaters Clinch River	Va.	2,481.0	59.9							2,540.9
71	Indian Creek	Va.	1,544.0	70.3	387.8	109.5					2,111.6
72	Martin Creek	Va.	213.6		103.5	109.5				92.0	518.6
	Total		29,485.8	1,292.4	897.0	1,513.1	23.3	32.0	2.7	92.0	33,338.3
	Grand Total		183,101.7	17,032.9	43,089.4	45,896.5	324.0	390.1	2.7	92.0	289,929.3

1/ As of October 1967.
2/ The U. S Forest Service will make a detailed study and appraisal to supplement the proposed project before authorization for detailed planning is initiated.

TABLE XLI-F(1)

Summary - Upstream Watersheds - Potential - Water Resource Survey 1/ - Cost Allocation ($1,000)

Sub-Region	Flood Prevention	M & I Water Supply	Recreation	Basic Facilities	Irrigation	Fish and Wildlife	Drainage	Water Quality Management	Total
A	None								
B	19,678.9	670.4	4,639.8	2,051.4		358.1			27,398.6
C	None								
D	13,321.1	1,359.8	354.7	1,989.0	300.7				17,325.3
E	14,799.9	251.7	781.9	557.0					16,390.5
F	59,400.1	11,315.1	25,567.5	29,480.4					125,763.1
G	30,953.3	1,319.6	8,500.4	8,041.0					48,814.3
H	2,672.4	70.6	637.3	384.4					3,764.7
I	12,790.2	753.3	1,710.8	1,880.2					17,134.5
J	29,485.8	1,292.4	897.0	1,513.1	23.3	32.0	2.7	92.0	33,338.3
Total	183,101.7	17,032.9	43,089.4	45,896.5	324.0	390.1	2.7	92.0	289,929.3

1/ As of October 1967.

TABLE XLII

Characteristics of Major Soils in the Appalachian Region

MAJOR SOILS	PHYSIOGRAPHIC POSITION	DOMINANT SLOPE RANGE IN PER CENT	MAJOR SOIL PROPERTIES 1/				LIMITING FACTORS	MAJOR PRESENT USE
			TEXTURE	DRAINAGE	PERMEABILITY	HYDROLOGIC GROUP		
Allenwood	Terrace	3 - 15	Medium	Well	Moderate	B	Erosion	Farming
Ashe	Uplands (mountainous)	25 - 70	Moderately Coarse to medium	Somewhat Excessive	Moderately rapid	B	Bedrock 20-60", erosion, stoniness	Woodland
Atkins	Bottom lands	0 - 3	Medium	Poor	Slow	D	Wetness flooding	Farming
Barbour	Bottom lands	0 - 3	Medium to Moderately Coarse	Well	Rapid	B	Flooding	Farming
Belmont	Uplands	5 - 50	Medium	Well	Moderate	B	Bedrock 20-40", erosion, stoniness	Farming, Woodland
Berks	Uplands	5 - 50	Medium	Well	Moderate to rapid	C	Bedrock 20-40', coarse fragments	Farming, Woodland
Bibb	Alluvial	0 - 2	Medium	Poor	Moderate to slow	C	Flooding, wetness	Woodland
Brandywine	Uplands	3 - 15	Medium	Well	Moderate to rapid	C	Erosion, droughtiness	Farming
Calvin	Uplands	5 - 50	Medium	Well	Moderate to rapid	C	Bedrock 12-40", erosion	Farming Woodland
Catalpa	Alluvial	0 - 3	Fine	Somewhat Poor	Very slow	C	Flooding	Farming
Cavode	Uplands	0 - 8	Fine	Somewhat Poor	Slow	C	Erosion, slow permeability, wetness	Farming
Chandler	Uplands	20 - 70	Medium	Somewhat Excessive	Moderately rapid	C	Bedrock 20-60", erosion, droughtiness	Woodland
Chastain	Alluvial	0 - 2	Moderate Fine	Poor	Slow	D	Flooding	Woodland
Chenango	Terrace	3 - 20	Medium	Well	Rapid	B	Erosion, droughtiness	Farming

TABLE XLII (continued)
Characteristics of Major Soils in the Appalachian Region

MAJOR SOILS	PHYSIOGRAPHIC POSITION	DOMINANT SLOPE RANGE IN PER CENT	MAJOR SOIL PROPERTIES 1/				LIMITING FACTORS	MAJOR PRESENT USE
			TEXTURE	DRAINAGE	PERMEABILITY	HYDROLOGIC GROUP		
Clifton	Uplands	5 - 30	Fine	Well	Moderate	B	Erosion	Farming
Clymer	Uplands	3 - 15	Medium	Well	Moderate to rapid	B	Erosion	Farming
Colbert	Uplands depressions	0 - 10	Fine	Moderately well to some-what poor	Slow	D	Slow permeability, wetness	Farming
Cookport	Uplands	3 - 10	Medium	Moderately well	Slow	C	Fragipan at 20"	Farming
Corydon	Uplands	3 - 40	Fine	Well	Moderate	C	Erosion, droughtiness	Pasture
Dandridge	Uplands	15 - 40	Fine	Somewhat excessive	Moderately slow	C	Slope, soil depth	Farming, Woodland
Dekalb	Uplands	10 - 60	Coarse	Well	Moderate to rapid	B	Bedrock 20-40", stoniness	Woodland
Duffield	Uplands	3 - 15	Medium	Well	Moderate	B	Erosion	Farming
Dunmore	Uplands	3 - 20	Fine	Well	Slow	C	Erosion	Farming
Edom	Uplands	5 - 40	Medium to fine	Well	Moderate	C	Erosion	Farming
Enon	Uplands	4 - 10	Fine	Well	Slow	C	Erosion, slow permeability	Woodlands
Faulkner	Uplands	1 - 8	Medium	Somewhat poor	Very slow	D	Soil drainage, erosion	---------
Frankstown	Uplands	3 - 30	Medium to fine	Well	Moderate	B	Erosion	Farming
Frederick	Uplands	3 - 20	Fine	Well	Moderate	B	Erosion	Farming
Gilpin	Uplands	10 -50	Medium	Well	Moderate	C	Erosion, bedrock 20-40"	Farming
Granville	Uplands	3 - 10	Moderately fine to fine	Well	Moderate	B	Erosion	Farming

TABLE XLII (continued)
Characteristics of Major Soils in the Appalachian Region

MAJOR SOILS	PHYSIOGRAPHIC POSITION	DOMINANT SLOPE RANGE IN PER CENT	MAJOR SOIL PROPERTIES 1/				LIMITING FACTORS	MAJOR PRESENT USE
			TEXTURE	DRAINAGE	PERMEABILITY	HYDROLOGIC GROUP		
Guernsey	Uplands	3 - 20	Fine	Moderately well	Slow	C	Erosion, slow permeability	Farming
Hagerstown	Uplands	3 - 30	Fine	Well	Moderate	B	Erosion, rockines	Farming
Hartsells	Uplands	3 - 10	Medium	Well	Moderate to rapid	B	Erosion	Farming
Hayesville	Uplands	8 - 30	Moderately fine to fine	Well	Moderate	B	Erosion	Woodland, Farming
Herndon	Uplands	4 - 10	Fine	Well	Moderate	C	Erosion	Farming, Woodland
Huntington	Bottom lands	0 - 3	Medium	Well	Moderate	B	Flooding	Farming
Jefferson	Colluvial	3 - 25	Medium	Well	Moderate	B	Erosion, stoniness	Farming, Woodland
Laidig	Colluvial	3 - 25	Medium	Well	Moderate to rapid	C	Erosion, stoniness	Woodland
Leeper	Alluvial	0 - 4	Fine	Somewhat poor	Very slow	D	Flooding	Farming
Lehew	Uplands	5 - 50	Coarse	Well	Moderate to rapid	B	Droughtiness, stoniness	Woodland
Lindside	Bottom lands	0 - 3	Medium	Moderately well	Moderate	C	Wetness, flooding	Farming
Lordstown	Uplands		Medium			C		
Louisa	Uplands	7 - 25	Moderately coarse to medium	Somewhat excessive	Moderately rapid	B	Bedrock 20-60", erosion	Woodland
Louisburg	Uplands	5 - 25	Moderately coarse	Well to excessively drained	Moderately rapid	B	Bedrock 24-48", erosion, stoniness	Woodland
Madison	Uplands	4 - 20	Fine	Well	Moderate	B	Erosion	Farming
Mardin	Uplands	3 - 25	Medium	Moderately well	Slow	C	Erosion, fragipan at 20"	Farming

TABLE XLII (continued)
Characteristics of Major Soils in the Appalachian Region

MAJOR SOILS	PHYSIOGRAPHIC POSITION	DOMINANT SLOPE RANGE IN PER CENT	MAJOR SOIL PROPERTIES 1/				LIMITING FACTORS	MAJOR PRESENT USE
			TEXTURE	DRAINAGE	PERMEABILITY	HYDROLOGIC GROUP		
Mayodan	Uplands	3 - 10	Fine	Well	Moderate	B	Erosion	Farming
Montevallo	Uplands	5 - 40	Medium	Well	Moderate to rapid	C	Bedrock 10-20"	Farming, Woodland
Morris	Uplands	0 - 8	Medium	Somewhat poor	Slow	C	Wetness, stoniness	Farming
Murrill	Colluvial	3 - 25	Medium	Well	Moderate	B	Erosion, stoniness	Farming, Woodland
Muskingum	Uplands	5 - 60	Medium	Well	Moderate	C	Erosion, stoniness	Farming, Woodland
Neubert	Bottom land	1 - 5	Medium	Well	Moderate	B	Flooding	Farming
Newark	Bottom land	0 - 3	Medium	Somewhat poor	Moderate to slow	C	Wetness, flooding	Farming
Ochlockonee	Alluvial	0 - 3	Medium	Well	Moderate to rapid	B	Flooding	Farming
Oquaga	Uplands	3 - 20	Medium	Well	Rapid	C	Erosion, stoniness, droughtiness	Woodland
Philo	Bottom land	0 - 3	Medium to coarse	Moderately well	Moderate	C	Wetness, flooding	Farming
Pope	Bottom lands	0 - 3	Medium to coarse	Well	Rapid	B	Flooding	Farming
Porters	Uplands (mountainous)	25 - 45	Medium	Well	Moderately rapid	B	Erosion, stoniness	Farming, Woodland
Rabun	Uplands	15 - 30	Fine	Well	Moderate	B	Erosion	Woodland
Ramsey	Uplands	5 - 40	Coarse	Well	Rapid	B	Droughtiness, stoniness	Woodland
Savannah	Uplands	0 - 8	Medium	Moderate	Moderate	C	Erosion, fragipan	Farming, Woodland
Sequoia	Uplands	3 - 15	Fine	Well	Moderate to slow	C	Slope	Farming
Stendal	Bottom lands	0 - 3	Medium			C		

TABLE XLII (continued)
Characteristics of Major Soils in the Appalachian Region

MAJOR SOILS	PHYSIOGRAPHIC POSITION	DOMINANT SLOPE RANGE IN PER CENT	MAJOR SOIL PROPERTIES 1/				LIMITING FACTORS	MAJOR PRESENT USE
			TEXTURE	DRAINAGE	PERMEABILITY	HYDROLOGIC GROUP		
Talbott	Uplands	3 - 20	Fine	Well	Moderately to slow	D	Slope, texture	Farming
Tate	Uplands drains and footslopes	5 - 20	Medium to moderately fine	Well or moderately well	Moderate	B	Erosion, seepage	Farming
Tellico	Uplands	20 - 40	Fine	Well	Moderately slow to slow	B	Slope	Farming, Woodland
Tioga	Bottom lands	0 - 3	Medium to coarse	Well	Rapid	B	Flooding	Farming
Tusquitee	Uplands drains and footslopes	10 - 25	Medium to moderately fine	Well	Moderately rapid	B	Erosion, stoniness	Farming
Upshur	Uplands	5 - 50	Fine	Well	Slow	C	Erosion	Farming Woodland
Urbo	Alluvial	0 - 2	Fine	Somewhat poor	Very slow	D	Flooding	Woodland
Volusia	Uplands	3 - 20	Medium	Somewhat poor to poor	Slow to very slow	C	Wetness, stoniness, erosion, fragipan	Farming
Weikert	Uplands	5 - 30	Medium	Well	Moderate to rapid	C	Bedrock less than 20", erosion, droughtiness	Woodlands, Farming
Wellston	Uplands	3 - 10	Medium	Well	Moderate	B	Erosion	Farming
Westmoreland	Uplands	5 - 50	Medium	Well	Moderate	C	Erosion	Farming
Wharton	Uplands	3 - 15	Fine	Moderately well	Slow	C	Erosion, slow permeability	Farming

TABLE XLII (continued)
Characteristics of Major Soils in the Appalachian Region

MAJOR SOILS	PHYSIOGRAPHIC POSITION	DOMINANT SLOPE RANGE IN PER CENT	MAJOR SOIL PROPERTIES 1/				LIMITING FACTORS	MAJOR PRESENT USE
			TEXTURE	DRAINAGE	PERMEABILITY	HYDROLOGIC GROUP		
Wheeling	River Terraces	0 - 10	Medium	Well	Moderate	B	Erosion	Farming, Urban
Wilkes	Uplands	10 - 25	Moderately coarse to medium	Well	Moderately slow	C	Bedrock 20-48", erosion, stoniness	Woodland

1/ General terms for soil textural classes are given on page 213 of the Soil Survey Manual, USDA Handbook No. 18. Texture applies to surface and subsurface horizons to a depth, in general, of about 40 inches, and does not take into account the presence of coarse fragments. Soil drainage classes are defined on pages 170-172 of the Soil Survey Manual and soil permeability classes are defined on page 168 of the Soil Survey Manual. The Hydrologic Groups are defined on page 7.2 in Section 4 of the SCS National Engineering Handbook and classifications assigned are according to table 7.1 in Section 4 of the National Engineering Handbook.

TABLE XLIII

Summary of Installation and Annual Costs ($1,000)

Watershed Name	State	Location Number	Construction	Installation Services	Land Easements and Rights-of-Way	Administration of Contracts	Total Installation Cost	Annual	Operations & Maintenance	Total Annual Cost
WATER SUB-REGION A										
Nescopeck Creek	Pa.	42					1,510.0	49.5	0.8	50.3
WATER SUB-REGION B										
Marsh Ditch	N.Y.	16	325.7	88.0	33.6	3.2	450.5	14.8	5.4	20.2
New Berlin	N.Y.	22	320.0	86.0	8.1	0.9	415.0	25.0	4.8	29.8
Newtown Hoffman Cr.	N.Y.	17	2,991.8	807.5	596.6	59.8	4,455.7	146.0	27.2	173.2
Georges Creek	Md.	4	1,421.0	356.0	364.2	18.0	2,159.2	70.7	1.8	72.5
Upper Casselman River	Md.	2	1,295.0	388.5	276.6	19.0	1,979.1	68.1	2.6	70.7
Cayuga Inlet	N.Y.	20	1,043.0	282.0	731.0	22.0	2,078.0	70.4	2.8	73.2
Stony Creek	Pa.	66	6,210.0	816.7	751.5	73.0	7,851.2	257.2	112.5	369.7
Wills Creek	Pa.	73	3,938.1	620.1	535.9	27.0	5,121.1	167.8	47.4	215.2
Total			17,544.6	3,444.9	3,289.4	231.0	24,509.8	820.0	204.5	1,024.5
WATER SUB-REGION C		None								
WATER SUB-REGION D										
Camp-Cane Creek	N.C.	8	717.8	221.3	217.5	11.7	1,168.3	38.3	23.2	61.5
Turner Creek	N.C.	15	120.1	48.2	13.4	2.0	183.7	7.1	2.0	9.1
Little Beaver Dam Cr.	S.C.	15	469.0	130.8	170.1	3.6	773.5	26.2	4.2	30.4
North Oconee River	Ga.	60	1,426.1	428.0	110.4	7.2	1,971.7	64.6	11.9	76.5
Hunting-Bear Creek	N.C.	17	4,088.5	1,100.1	667.0	23.3	5,879.0	192.6	37.5	230.1
Upper South Yadkin R.	N.C.	19	696.7	188.0	195.4	7.8	1,087.9	35.6	14.8	50.4
Cherokee Creek	S.C.	19	243.5	51.3	74.2	1.5	370.5	12.1	0.6	12.7
Eighteen Mile Creek	S.C.	20	1,021.7	226.3	476.7	9.5	1,734.2	56.8	32.9	89.7
North & Middle Tyger R.	S.C.	22	2,704.4	542.9	658.1	17.5	3,922.9	128.5	45.6	174.1
South Pacolet River	S.C.	23	1,636.7	347.7	363.7	11.0	2,359.1	77.3	52.0	129.3
Total			13,124.5	3,284.6	2,946.5	95.1	19,450.8	639.1	224.7	863.8

TABLE XLIII (continued)

Summary of Installation and Annual Costs ($1,000)

Watershed Name	State	Location Number	Construction	Installation Services	Land Easements and Rights-of-Way	Administration of Contracts	Total Installation Cost	Annual	Operations & Maintenance	Total Annual Cost
WATER SUB-REGION E										
Cahulga Creek	Ala.	20	291.1	68.5	56.0	0.8	416.4	13.6	1.9	15.5
Hudson River	Ga.	46	2,763.2	814.4	261.4	13.2	3,852.2	156.9	38.3	195.2
Suwanee Creek	Ga.	55	820.1	246.0	417.4	3.0	1,486.5	50.4	15.1	65.5
Tesnatee Creek	Ga.	56	932.7	271.6	128.6	4.6	1,337.5	43.8	23.3	67.1
Brown Creek	Miss.	26	1,656.1	548.7	545.4	6.3	2,756.5	90.3	25.0	115.3
Line Creek	Miss.	27	3,336.3	834.1	750.0	10.0	4,930.4	161.5	30.0	191.5
Dyne Creek	Ala.	28	278.7	82.7	24.2	3.0	388.6	12.7	2.2	14.9
Sipsey Creek	Ala.	22	4,338.6	1,286.2	442.3	12.5	6,079.6	199.2	34.9	234.1
Jacks & Socapotay Cr.	Ala.	30	504.9	156.8	56.0	1.0	718.7	23.5	0.6	24.1
Little Sandy Creek	Ala.	33	510.3	166.5	78.5	2.5	757.8	24.8	3.7	28.5
Luxapalila Creek	Ala.	34	3,313.5	982.2	529.7	18.5	4,843.9	158.7	24.9	183.6
Mahan Creek	Ala.	35	370.4	109.7	52.9	2.0	535.0	17.5	3.0	20.5
Mill Creek	Ala.	38	590.2	175.1	133.6	2.5	901.4	29.5	4.7	34.2
Wehadkee Creek	Ala.	37	289.9	86.1	19.8	1.5	397.3	13.0	2.3	15.3
Mill Creek Area	Ga.	59	448.0	134.5	29.4	1.6	613.5	24.4	9.8	34.2
Wahoo-Little River	Ga.	62	355.6	106.6	102.6	2.1	566.9	22.6	2.5	25.1
Young Cane Creek	Ga.	63	401.8	120.7	62.7	2.6	587.8	23.4	3.1	26.5
Total			21,201.4	6,190.4	3,690.5	87.7	31,170.0	1,065.8	225.3	1,291.1
WATER SUB-REGION F										
Short Creek	Ohio	8	2,038.0	564.4	470.3	62.7	3,135.4	110.9	28.2	139.1
Jacobs Creek	Pa.	33	2,183.8	546.6	1,070.0	23.0	3,823.4	125.2	30.4	155.6
Stonecoal Creek	W.Va.	63	357.7	65.7	180.0	1.3	604.7	19.8	5.2	25.0
Ten Mile Creek	W.Va.	64	980.6	255.2	849.7	3.5	2,089.0	68.4	10.5	78.9
Great Valley	N.Y.	13	1,495.0	403.5	862.5	30.1	2,791.1	91.4	3.3	94.7
Little Valley	N.Y.	15	318.0	80.0	148.3	6.1	552.4	18.1	1.0	19.1
Blacklick Creek	Pa.	54	4,068.8	635.9	353.0	28.0	5,085.6	166.6	62.1	228.7
Brokenstraw Creek	Pa.	55	2,974.9	674.5	2,101.3	37.0	5,787.7	189.6	106.6	296.2
Connoquenessing Cr.	Pa.	25	8,670.7	1,713.3	4,135.8	117.5	14,637.3	479.5	133.5	613.0
French Creek (Upper)	Pa.	56	4,561.0	914.1	2,591.2	33.0	8,099.3	265.3	163.9	429.2
Indian Creek	Pa.	57	2,717.0	444.0	1,407.6	32.0	4,600.6	150.7	27.0	177.7
LeBoeuf Creek	Pa.	58	2,851.6	638.4	606.0	22.0	4,118.0	134.9	80.2	215.1
Mahoning Creek	Pa.	59	3,531.0	591.9	843.1	39.0	5,005.0	164.0	108.0	272.0
Oswago Creek	Pa.	60	3,500.7	715.5	715.3	31.0	4,962.5	162.0	113.8	275.8
Potato Creek	Pa.	61	2,834.7	473.5	647.9	24.1	3,980.2	130.4	19.6	150.0

TABLE XLIII (continued)

Summary of Installation and Annual Costs ($1,000)

Watershed Name	State	Location Number	Construction	Installation Services	Land Easements and Rights-of-Way	Administration of Contracts	Total Installation Cost	Annual	Operations & Maintenance	Total Annual Cost
WATER SUB-REGION F (continued)										
Raccoon Creek	Pa.	62	1,172.4	224.9	506.0	18.5	1,921.8	63.0	18.4	81.4
Sandy Lick Creek	Pa.	63	2,862.7	598.4	2,100.0	41.0	5,602.1	183.5	40.0	223.5
Sewickley Creek	Pa.	64	2,702.4	438.3	366.1	22.0	3,528.8	115.6	47.1	162.7
Sugar Creek	Pa.	67	4,814.6	1,082.4	1,654.6	31.5	7,583.1	248.4	260.3	508.7
Tionesta Creek	Pa.	68	2,934.8	641.1	363.7	40.0	3,979.6	130.4	50.3	180.7
Turtle Creek	Pa.	69	2,036.4	408.2	871.2	29.0	3,344.8	109.6	48.4	158.0
U. Allegheny River	Pa.	70	3,907.0	836.2	1,568.6	51.0	6,362.8	208.4	65.0	273.4
U. Loyalhanna Creek	Pa.	71	4,020.3	548.3	3,011.3	41.5	7,621.4	249.7	98.2	347.9
W. Branch Clarion R.	Pa.	72	3,668.8	737.8	308.6	36.0	4,751.2	155.6	91.6	247.2
Elk Creek	W.Va.	79	2,874.7	661.1	578.8	28.3	4,142.9	135.7	12.8	148.5
Kings Creek	W.Va.	81	930.1	176.0	85.9	2.5	1,194.5	39.1	8.4	47.5
Limestone Run	W.Va.	82	427.0	94.7	365.0	4.0	890.7	29.2	15.0	44.2
Paw Paw Creek	W.Va.	84	1,033.8	243.5	438.4	3.8	1,719.5	56.3	6.8	63.1
Prickett Creek	W.Va.	85	415.7	71.2	213.2	0.3	700.4	22.9	5.0	27.9
Sandy Creek	W.Va.	86	1,687.9	306.3	109.7	3.3	2,107.2	69.0	10.8	79.8
Simpson Creek	W.Va.	87	1,458.9	402.1	750.6	7.1	2,618.7	85.8	6.5	92.3
Three Fork Creek	W.Va.	88	1,633.1	337.8	541.0	3.7	2,515.6	82.4	10.2	92.6
U. Middle Island Cr.	W.Va.	89	1,190.8	276.2	2,654.0	3.4	4,124.4	135.1	10.8	145.9
Total			82,854.9	16,810.1	33,468.7	857.2	133,981.8	2,081.9	774.4	2,856.3
WATER SUB-REGION G										
Grassy Creek	Ky.	7	305.0	91.3	57.6	1.7	455.6	15.1	5.4	20.5
L. Fork of L. Sandy R.	Ky.	8	984.3	196.9	1,570.7	7.3	2,759.2	81.2	3.0	84.2
Pine Creek	Ohio	7	1,066.4	295.3	246.1	32.8	1,640.6	53.7	10.2	63.9
Elk Two Mile Creek	W.Va.	29	910.7	236.1	943.5	1.8	2,092.1	68.5	1.2	69.7
Fourpole Creek	W.Va.	32	694.5	137.3	559.9	0.8	1,392.5	45.6	16.0	61.6
Kanawha Two-Mile Cr.	W.Va.	38	1,110.1	206.8	477.8	1.2	1,785.9	58.5	23.6	82.1
Rocky Fork Creek	W.Va.	59	224.0	67.6	86.2	1.0	378.8	12.4	4.5	16.9
Slack Branch (Quick)	W.Va.	61	983.9	180.4	123.6	1.1	1,289.0	42.2	5.0	47.2
E. Fork Little Sandy	Ky.	16	455.6	156.2	887.6	4.0	1,503.4	49.3	6.9	56.2
Triplett Creek	Ky.	22	2,055.9	550.2	1,094.0	20.5	3,720.6	121.9	10.9	132.8
Federal Valley	Ohio	9	1,712.9	548.5	880.9	50.6	3,192.9	104.6	30.0	134.6
Little Salt Creek	Ohio	10	1,799.9	582.9	832.5	54.0	3,269.3	107.1	12.0	119.1
Little Scioto River	Ohio	11	1,449.0	471.4	985.9	43.4	2,949.7	96.6	24.2	120.8
Moxahala-Jonathan Cr.	Ohio	12	2,098.0	782.0	966.0	60.0	3,906.0	132.3	33.8	116.1

TABLE XLIII (continued)

Summary of Installation and Annual Costs ($1,000)

Watershed Name	State	Location Number	Construction	Installation Services	Land Easements and Rights-of-Way	Administration of Contracts	Total Installation Cost	Annual	Operations & Maintenance	Total Annual Cost
WATER SUB-REGION G (continued)										
O'Bannon Creek	Ohio	13	1,112.6	336.3	482.2	31.9	1,973.0	64.6	22.0	86.6
Upper White Oak Creek	Ohio	14	1,220.0	384.0	1,141.0	37.0	2,782.0	91.1	21.7	112.8
Wakatomika Creek	Ohio	15	2,889.0	902.0	1,118.0	87.0	4,996.0	163.7	42.5	206.2
Wolf Creek	Ohio	16	2,474.0	787.0	1,385.0	73.0	4,719.0	154.6	77.9	232.5
Headwaters Holston R.	Va.	76	4,009.4	790.0	516.6	10.0	5,326.0	174.5	49.1	223.6
French Creek	W.Va.	80	1,064.4	227.6	468.2	2.5	1,762.7	58.0	14.6	72.6
Mate Creek	W.Va.	83	1,851.0	236.1	511.4	1.2	2,599.7	85.2	7.5	92.7
Big Creek	W.Va.	92	906.0	216.9	149.5	2.0	1,274.4	41.7	13.9	55.6
U. Buckhannon River	W.Va.	93	3,692.3	678.5	463.8	5.0	4,839.6	158.5	9.0	167.5
Total			35,068.9	9,061.3	15,948.0	529.8	60,608.0	1,980.9	444.9	2,425.8
WATER SUB-REGION H										
Redlick Creek	Ky.	12	682.9	136.6	148.7	2.8	971.0	32.5	7.9	40.4
Upper Howard Creek	Ky.	24	284.3	56.8	79.4	3.0	423.5	13.9	6.3	20.2
Hanging Fork Creek	Ky.	17	655.5	172.1	337.9	6.5	1,172.0	38.4	7.4	45.8
Silver Creek	Ky.	21	524.9	157.1	633.6	2.6	1,318.2	43.2	7.1	50.3
Upper Red River	Ky.	23	441.0	122.7	706.8	4.0	1,274.5	41.7	6.9	48.6
Total			2,588.6	645.3	1,906.4	18.9	5,159.2	169.7	35.6	205.3
WATER SUB-REGION I										
Marsh Creek	Ky.	10	528.0	174.0	7.1	6.2	715.3	25.3	7.9	33.2
Roaring River	Tenn.	14	1,314.0	451.0	729.0	6.0	2,500.0	81.9	22.0	103.9
Smith Fork Creek	Tenn.	15	2,914.2	874.0	1,412.9	4.2	5,205.3	170.5	9.9	180.4
Casey Creek	Ky.	15	821.1	271.8	263.0	4.3	1,360.2	44.6	7.8	52.4
Marrowbone Creek	Ky.	18	709.5	241.4	496.1	4.2	1,451.2	47.5	7.5	55.0
Richland Creek	Ky.	19	762.9	176.0	883.4	7.9	1,830.2	59.1	12.3	71.4
Russell Creek	Ky.	20	1,881.0	526.0	926.6	10.4	3,344.0	112.0	15.7	127.7
Calfkiller River	Tenn.	21	3,082.8	738.4	637.3	4.5	4,463.0	146.2	31.3	177.5
Putnam-Cane Creek	Tenn.	23	307.1	85.7	119.3	1.3	513.4	16.8	7.1	23.9
Salt Lick Creek	Tenn.	28	1,814.9	528.2	560.3	4.7	2,908.1	95.3	24.4	119.7
Total			14,135.5	4,066.5	6,035.0	53.7	24,290.7	799.2	145.9	945.1

TABLE XLV (continued)

TABLE XLIII (continued)

Summary of Installation and Annual Costs ($1,000)

Watershed Name	State	Location Number	Construction	Installation Services	Land Easements and Rights-of-Way	Administration of Contracts	Total Installation Cost	Annual	Operations & Maintenance	Total Annual Cost
WATER SUB-REGION I										
Cane Creek	N.C.	7	1,422.4	425.7	524.6	9.3	2,382.0	80.7	17.5	98.2
Boiling Fork Creek	Tenn.	9	387.2	90.6	135.3	1.2	614.3	24.4	4.7	29.1
Hickory Creek	Tenn.	12	1,183.0	288.2	363.8	1.5	1,836.5	60.2	6.6	66.8
Horse Creek	Tenn.	13	1,043.6	286.4	454.0	2.1	1,786.1	58.5	15.0	73.5
Sweetwater Creek	Tenn.	16	1,014.0	365.0	329.5	4.2	1,712.7	56.1	13.8	69.9
Upper Clinch Valley	Va.	64	1,187.7	242.0	119.0	2.3	1,551.0	50.8	4.1	54.9
Cane Creek	Ala.	26	207.0	61.4	32.3	2.0	302.7	9.9	1.7	11.6
Cypress Creek	Ala.	27	3,224.1	955.9	815.1	14.0	5,009.1	164.1	25.4	189.5
Limestone Creek	Ala.	31	1,718.0	510.3	371.8	5.0	2,605.1	85.3	13.8	99.1
Little Bear Creek	Ala.	32	359.7	106.7	65.6	1.5	533.5	17.5	2.9	20.4
Headwaters Chattooga R.	Ga.	58	2,019.9	604.3	1,150.5	5.7	3,780.4	123.8	30.0	153.8
Peavine Creek	Ga.	61	1,033.5	308.0	348.0	3.3	1,692.8	53.1	23.2	76.3
Tallulah Creek 1/	N.C.	18	2,101.5	649.0	625.6	9.0	3,385.0	110.9	2.4	113.3
Bent Creek	Tenn.	17	883.0	282.5	298.2	2.4	1,466.1	47.4	5.0	52.4
Blackwater Creek	Tenn.	18	1,121.0	259.8	163.9	2.5	1,547.2	50.7	13.4	64.1
Black Wolf Creek	Tenn.	19	467.5	136.0	78.8	1.8	684.1	20.0	2.6	22.6
Bull Run Creek	Tenn.	20	1,132.6	269.6	399.2	1.9	1,803.3	59.1	6.0	65.1
Charles Creek	Tenn.	24	406.5	113.7	158.2	1.6	680.0	22.3	2.7	25.0
Coahulla Creek	Tenn.	29	1,005.6	301.0	353.0	3.6	1,663.2	54.5	23.2	77.7
Mountain Creek	Tenn.	26	438.1	120.3	210.3	1.0	769.7	25.2	3.6	28.8
Perkins Creek	Tenn.	27	75.0	25.0	17.5	0.5	118.0	3.9	1.6	5.5
Indian Creek	Va.	71	1,598.7	315.6	189.1	8.2	2,111.6	69.2	11.5	80.7
Martin Creek	Va.	72	370.3	92.2	53.9	2.2	518.6	17.0	7.0	24.0
Total			24,399.9	6,809.2	7,257.2	86.8	38,553.0	1,264.6	237.7	1,502.3
Grand Total			210,918.3	50,303.1	74,541.7	1,960.2	339,223.3	8,870.7	2,293.8	11,164.5

1/ The U. S. Forest Service will make a detailed study and appraisal to supplement the proposed project before authorization for detailed planning is initiated.

TABLE XLV (continued)

TABLE XLIV

State and Appalachian Planning Sub-Regions by Counties

County	Appalachian Regional Commission Code No.	Office of Appalachian Studies, Water Sub-Region
ALABAMA (35)		
Bibb	59	E
Blount	59	E
Calhoun	57	E
Chambers	58	E
Cherokee	57	E
Chilton	59	E
Clay	58	E
Cleburne	57	E
Colbert	56	J
Coosa	58	E
Cullman	59	E
DeKalb	57	E
Elmore	58	E
Etowah	57	E
Fayette	59	E
Franklin	56	J
Jackson	56	J
Jefferson	59	E
Lamar	59	E
Lauderdale	56	J
Lawrence	56	J
Limestone	56	J
Madison	56	J
Marion	59	E
Marshall	56	J
Morgan	56	J
Pickens	59	E
Randolph	58	E
Saint Clair	59	E
Shelby	59	E
Talladega	59	E
ALABAMA (continued)		
Tallapoosa	58	E
Tuscaloosa	59	E
Walker	59	E
Winston	59	E
GEORGIA (35)		
Banks	52	E
Barrow	53	D
Bartow	51	E
Carroll	55	E
Catoosa	51	J
Chattooga	51	E
Cherokee	52	E
Dade	51	J
Dawson	52	E
Douglas	54	E
Fannin	52	E
Floyd	51	E
Forsyth	52	E
Franklin	52	E
Gilmer	52	E
Gordon	51	E
Gwinnett	54	E
Habersham	52	E
Hall	52	E
Haralson	51	E
Heard	55	E
Jackson	53	D
Lumpkin	52	E
GEORGIA (continued)		
Madison	53	D
Murray	51	E
Paulding	51	E
Pickens	52	E
Polk	51	E
Rabun	52	E
Stephens	52	E
Towns	52	E
Union	52	E
Walker	51	J
White	52	E
Whitfield	51	E
KENTUCKY (49)		
Adair	29A	I
Bath	36A	H
Bell	31	I
Boyd	34	G
Breathitt	32A	H
Carter	34	G
Casey	29A	I
Clark	35A	H
Clay	31	I
Clinton	30	I
Cumberland	29A	I
Elliott	34	G
Estill	35A	H
Fleming	36B	H
Floyd	33	G
KENTUCKY (continued)		
Garrard	35B	H
Green	29A	I
Greenup	34	G
Harlan	31	I
Jackson	31	I
Johnson	33	G
Knott	32B	H
Knox	31	I
Laurel	31	I
Lawrence	34	G
Lee	32A	H
Leslie	32B	H
Letcher	32B	H
Lewis	36B	G
Lincoln	35B	H
McCreary	30	I
Madison	35A	H
Magoffin	33	G
Martin	33	G
Menifee	36A	H
Monroe	29B	I
Montgomery	36A	H
Morgan	36A	G
Owsley	32A	H
Perry	32B	H
Pike	33	G
Powell	35A	H
Pulaski	30	I
Rockcastle	31	I
Rowan	36A	G
Russell	29A	I

TABLE XLIV (continued)

State and Appalachian Planning Sub-Regions by Counties

County	Appalachian Regional Commission Code No.	Office of Appalachian Studies, Water Sub-Region
KENTUCKY (continued)		
Wayne	30	I
Whitley	31	I
Wolfe	32A	H
MARYLAND (3)		
Allegany	37	B
Garrett	37	B
Washington	37	B
MISSISSIPPI (20)		
Alcorn	60	E
Benton	60	E
Chickasaw	60	E
Choctaw	60	E
Clay	60	E
Itawamba	60	E
Kemper	60	E
Lee	60	E
Lowndes	60	E
Marshall	60	E
Monroe	60	E
Noxubee	60	E
Oktibbeha	60	E
Pontotoc	60	E
Prentiss	60	E
Tippah	60	E
Tishomingo	60	E
Union	60	E
Webster	60	E
Winston	60	E

County	Appalachian Regional Commission Code No.	Office of Appalachian Studies, Water Sub-Region
NEW YORK (14)		
Allegany	1	F
Broome	2	B
Cattaraugus	1	F
Chautauqua	1	F
Chemung	1	B
Chenango	2	B
Cortland	2	B
Delaware	2	B
Otsego	2	B
Schoharie	2	B
Schuyler	1	B
Steuben	1	B
Tioga	2	B
Tompkins	2	B
NORTH CAROLINA (29)		
Alexander	47	D
Alleghany	48	D
Ashe	48	D
Avery	46	J
Buncombe	44	J
Burke	47	D
Caldwell	47	D
Cherokee	43	J
Clay	43	J
Davie	49	D
Forsyth	49	D
Graham	43	J
Haywood	44	J
Henderson	44	J
Jackson	43	J
McDowell	45	D

County	Appalachian Regional Commission Code No.	Office of Appalachian Studies, Water Sub-Region
NORTH CAROLINA (continued)		
Macon	43	J
Madison	44	J
Mitchell	46	J
Polk	45	D
Rutherford	45	D
Stokes	49	D
Surry	49	D
Swain	43	J
Transylvania	44	J
Watauga	46	J
Wilkes	48	D
Yadkin	49	D
Yancey	46	J
OHIO (28)		
Adams	13	G
Athens	12	G
Belmont	12	F
Brown	13	G
Carroll	11	G
Clermont	13	G
Coshocton	11	G
Gallia	13	G
Guernsey	11	G
Harrison	11	G
Highland	13	G
Hocking	12	G
Holmes	11	G
Jackson	13	G
Jefferson	11	F
Lawrence	13	G
Meigs	12	G

County	Appalachian Regional Commission Code No.	Office of Appalachian Studies, Water Sub-Region
OHIO (continued)		
Monroe	12	G
Morgan	12	G
Muskingum	11	G
Noble	12	G
Perry	12	G
Pike	13	G
Ross	13	G
Scioto	13	G
Tuscarawas	11	G
Vinton	13	G
Washington	12	G
PENNSYLVANIA (52)		
Allegheny	5	F
Armstrong	5	F
Beaver	5	F
Bedford	7	B
Blair	7	B
Bradford	9	B
Butler	5	F
Cambria	7	B
Cameron	6	F
Carbon	10	A
Centre	8	B
Clarion	4	F
Clearfield	6	F
Clinton	8	B
Columbia	8	B
Crawford	4	F
Elk	6	F
Erie	4	F
Fayette	5	F

TABLE XLIV (continued)

State and Appalachian Planning Sub-Regions by Counties

County	Appalachian Regional Commission Code No.	Office of Appalachian Studies, Water Sub-Region
PENNSYLVANIA (continued)		
Forest	4	F
Fulton	7	B
Greene	5	F
Huntingdon	7	B
Indiana	5	F
Jefferson	6	F
Juniata	8	B
Lackawanna	10	A
Lawrence	4	F
Luzerne	10	A
Lycoming	8	B
McKean	6	F
Mercer	4	F
Mifflin	8	B
Monroe	10	A
Montour	8	B
Northumberland	8	B
Perry	8	B
Pike	10	A
Potter	6	F
Schuylkill	10	A
Snyder	8	B
Somerset	7	B
Sullivan	9	B
Susquehanna	9	B
Tioga	9	B
Union	8	B
Venango	4	F
Warren	4	F
Washington	5	F
Wayne	10	A
Westmoreland	5	F
Wyoming	9	B

County	Appalachian Regional Commission Code No.	Office of Appalachian Studies, Water Sub-Region
SOUTH CAROLINA (6)		
Anderson	50	D
Cherokee	50	D
Greenville	50	D
Oconee	50	D
Pickens	50	D
Spartanburg	50	D
TENNESSEE (50)		
Anderson	41	J
Bledsoe	40	J
Blount	41	J
Bradley	40	J
Campbell	41	J
Cannon	38	I
Carter	42	J
Claiborne	41	J
Clay	38	I
Cocke	41	J
Coffee	39	J
Cumberland	38	I
DeKalb	38	I
Fentress	38	I
Franklin	39	J
Grainger	41	J
Greene	42	J
Grundy	39	J
Hamblen	41	J
Hamilton	40	J
Hancock	42	J
Hawkins	42	J
Jackson	38	I

County	Appalachian Regional Commission Code No.	Office of Appalachian Studies, Water Sub-Region
TENNESSEE (continued)		
Jefferson	41	J
Johnson	42	J
Knox	41	J
Loudon	41	J
McMinn	40	J
Macon	38	I
Marion	40	J
Meigs	40	J
Monroe	41	J
Morgan	41	J
Overton	38	I
Pickett	38	I
Polk	40	J
Putnam	38	I
Rhea	40	J
Roane	41	J
Scott	41	J
Sequatchie	40	J
Sevier	41	J
Smith	38	I
Sullivan	42	J
Unicoi	42	J
Union	41	J
Van Buren	39	J
Warren	39	J
Washington	42	J
White	38	I
VIRGINIA (21)		
Alleghany	28	C
Bath	28	C

County	Appalachian Regional Commission Code No.	Office of Appalachian Studies, Water Sub-Region
VIRGINIA (continued)		
Bland	26	G
Botetourt	28	C
Buchanan	24	J
Carroll	26	G
Craig	28	C
Dickenson	24	J
Floyd	27	G
Giles	27	G
Grayson	26	G
Highland	28	C
Lee	23	J
Pulaski	27	G
Russell	24	J
Scott	23	J
Smyth	26	G
Tazewell	24	J
Washington	25	J
Wise	23	J
Wythe	26	G
WEST VIRGINIA (55)		
Barbour	20	G
Berkeley	19	B
Boone	14	G
Braxton	20	G
Brooke	17	F
Cabell	15	G
Calhoun	16	G
Clay	20	G
Doddridge	18	F
Fayette	21	G

TABLE XLIV (continued)
State and Appalachian Planning Sub-Regions by Counties

County	Appalachian Regional Commission Code No.	Office of Appalachian Studies, Water Sub-Region	County	Appalachian Regional Commission Code No.	Office of Appalachian Studies, Water Sub-Region
WEST VIRGINIA (continued)			WEST VIRGINIA (continued)		
Gilmer	18	F	Morgan	19	B
Grant	19	B	Nicholas	20	G
Greenbrier	20	G	Ohio	17	F
Hampshire	19	B	Pendleton	19	B
Hancock	17	F	Pleasants	16	G
Hardy	19	B	Pocahontas	20	G
Harrison	18	F	Preston	18	F
Jackson	16	G	Putnam	14	G
Jefferson	19	B	Raleigh	21	G
Kanawha	14	G	Randolph	20	G
Lewis	18	F	Ritchie	16	G
Lincoln	15	G	Roane	16	G
Logan	22	G	Summers	21	G
Marion	18	F	Taylor	18	F
Marshall	17	F	Tucker	20	G
Mason	15	G	Tyler	16	G
McDowell	22	G	Upshur	20	G
Mercer	21	G	Wayne	15	G
Mineral	19	B	Webster	20	G
Mingo	22	G	Wetzel	17	F
Monongalia	18	F	Wirt	16	G
Monroe	21	G	Wood	16	G
			Wyoming	22	G

TABLE XLIV-A

Summary - Number of Upstream Watersheds

State	Water Sub-Region			Total
Alabama	E	I		
Completed	3	2		5
Authorized	8	5		13
Invest.-Planned	7	-		7
WRS	8	4		12
Total	26	11		37
Recommended	15	4		19
Georgia	D	E	I	
Completed	2	8	-	10
Authorized	5	27	-	32
Invest.-Planned	-	3	-	3
WRS	1	3	2	6
Total	8	41	2	51
Recommended	1	6	2	9
Kentucky	G	H	I	
Completed	-	2	1	3
Authorized	-	2	1	3
Invest.-Planned	3	2	1	6
WRS	2	3	4	9
Total	5	9	7	21
Recommended	4	5	5	14
Maryland	B			
Completed	-			-
Authorized	1			1
Invest.-Planned	4			4
WRS	3			3
Total	8			8
Recommended	6			6
Mississippi	E			
Completed	1			1
Authorized	24			24
Invest.-Planned	23			23
WRS	-			-
Total	48			48
Recommended	23			23

State	Water Sub-Region			Total
New York	B	F		
Completed	2	-		2
Authorized	5	2		7
Invest.-Planned	3	-		3
WRS	2	2		4
Total	12	4		16
Recommended	4	2		6
North Carolina	D	I		
Completed	-	-		-
Authorized	7	1		8
Invest.-Planned	2	2		4
WRS	2	1		3
Total	11	4		15
Recommended	4	2		6
Ohio	F	G		
Completed	-	-		-
Authorized	-	4		4
Invest.-Planned	1	1		2
WRS	-	8		8
Total	1	13		14
Recommended	1	9		10
Pennsylvania	A	B	F	
Completed	-	1	3	4
Authorized	5	5	5	15
Invest.-Planned	1	1	1	3
WRS	-	2	18	20
Total	6	9	27	42
Recommended	1	2	19	22
South Carolina	D			
Completed	3			3
Authorized	8			8
Invest.-Planned	1			1
WRS	4			4
Total	16			16
Recommended	5			5

TABLE XLIV-A (continued)

Summary - Number of Upstream Watersheds

State	Water Sub-Region			Total
Tennessee	I	J		
Completed	1	-		1
Authorized	3	5		8
Invest.-Planned	2	4		6
WRS	4	8		12
Total	10	17		27
Recommended	5	12		17
Virginia	C	G	J	
Completed	-	1	-	1
Authorized	1	1	-	2
Invest.-Planned	10	3	2	15
WRS	-	1	4	5
Total	11	6	6	23
Recommended	9	4	4	17
West Virginia	B	F	G	
Completed	1	2	3	6
Authorized	4	4	6	14
Invest.-Planned	9	2	21	32
WRS	-	10	4	14
Total	14	18	34	66
Recommended	8	11	25	44

Appalachian Region

Status	WATER SUB-REGIONS A	B	C	D	E	F	G	H	I	J	Total
Completed	-	4	-	5	12	5	4	2	2	2	36
Authorized	5	15	1	20	59	11	11	2	4	11	139
Investigated-Planned	1	17	10	3	33	4	28	2	3	8	109
WRS	-	7	-	7	11	30	15	3	8	19	100
Total	6	43	11	35	115	50	58	9	17	40	384
Recommended	1	20	9	10	44	33	42	5	10	24	198

TABLE XLV

Upstream Watersheds - Identification and Location

Map No.	Watershed Name	LOCATION Counties	State	USDA Atlas of River Basin Number	Drainage Area (Acres)	Status 1/
WATER SUB-REGION A						
6	Brodhead	Monroe, Pike	Pa.	MA-3	18,624	Authorized for Installation
8	Green-Dreher	Monroe, Pike, Wayne	Pa.	MA-3	47,810	Authorized for Installation
10	Lackawazen Tributaries	Wayne	Pa.	MA-3	26,625	Authorized for Installation
11	Little Schuylkill River	Berks, Carbon, Schuylkill	Pa.	MA-3c	86,848	Authorized for Installation
15	Mauch Chunk Creek	Carbon, Schuylkill	Pa.	MA-3b	5,790	Authorized for Installation
42	*Nescopeck	Luzerne	Pa.	MA-5a	48,960	Investigated or Planned
WATER SUB-REGION B						
1	Little Youghiogheny River	Garrett	Md.	OR-2c	26,275	Authorized for Installation
4	*Georges Creek	Allegany	Md.	MA-7a	47,870	Potential - WRS
5	Little Beaver	Washington	Md.	MA-7	5,830	Potential - WRS
2	*Upper Casselman River	Garrett, Somerset (Pa.)	Md.	OR-2c	84,100	Potential - WRS
1	Dean Creek	Tioga	N.Y.	MA-5a	4,000	Completed
2	Great Brook	Chenango	N.Y.	MA-5	16,768	Completed
4	Genegantslet Creek	Broome, Chenango, Cortland	N.Y.	MA-5a1	66,457	Authorized for Installation
6	Little Choconut, Finch Hollow, Trout Brook	Broome	N.Y.	MA-5a	12,276	Authorized for Installation
7	Nanticoke Creek	Broome, Tioga	N.Y.	MA-5a	73,000	Authorized for Installation
8	Patterson, Brixius, Crey Cr.	Broome	N.Y.	MA-5a	8,000	Authorized for Installation
9	Upper Five Mile Creek	Steuben, Yates	N.Y.	MA-5a2	38,100	Authorized for Installation
16	*Marsh Ditch	Allegany, Steuben	N.Y.	MA-5a2	14,560	Investigated or Planned
22	*New Berlin	Chenango	N.Y.	MA-5a	3,000	Investigated or Planned
17	*Newtown-Hoffman Creek	Chemung, Schuyler	N.Y.	MA-5a2	54,600	Investigated or Planned
20	*Cayuga Inlet (Enfield)	Tompkins	N.Y.	GL-St.L-2b	181,760	Potential - WRS
25	West Branch Delaware River	Delaware, Schoharie	N.Y.	MA-3	231,680	Potential - WRS
1	Cory Creek	Tioga	Pa.	MA-5a2a	15,424	Completed
5	Briar Creek	Columbia, Luzerne	Pa.	MA-5a	9,344	Authorized for Installation
13	Marsh Creek	Tioga	Pa.	MA-5b3	52,940	Authorized for Installation
14	Martin Creek	Susquehanna	Pa.	MA-5a	31,680	Authorized for Installation
16	Middle Creek	Mifflin, Snyder, Union	Pa.	MA-5	84,096	Authorized for Installation
17	Mill Creek	Tioga	Pa.	MA-5a2a	8,430	Authorized for Installation
21	Bentley Creek	Bradford, Chemung (N.Y.)	Pa.	MA-5a2	36,850	Investigated or Planned
66	*Stony Creek	Cambria, Somerset	Pa.	OR-1d1	297,600	Potential - WRS
73	*Wills Creek	Bedford, Somerset	Pa.	MA-7	125,890	Potential - WRS
6	Warm Springs Run	Morgan	W.Va.	MA-7	7,264	Completed
10	Lunice Creek	Grant	W.Va.	MA-7b	57,285	Authorized for Installation
11	New Creek-Whites Run	Grant, Mineral	W.Va.	MA-7a	36,208	Authorized for Installation
12	Patterson Creek	Grant, Mineral	W.Va.	MA-7	181,248	Authorized for Installation
17	South Fork	Hardy, Highland (Va.), Pendleton	W.Va.	MA-7b	184,852	Authorized for Installation
P-3	*North Branch	Garrett, Grant (W.Va.)	Md.	MA-7a	190,272	Investigated or Planned
P-15	*Town Creek	Allegany, Bedford (Pa.)	Md.	MA-7	101,120	Investigated or Planned
P-25	*Tonoloway	Washington, Fulton (Pa.)	Md.	MA-7	74,304	Investigated or Planned
P-26	*Licking Creek	Washington, Fulton (Pa.)	Md.	MA-7	140,672	Investigated or Planned
P-10	*North Fork South Branch	Grant, Pendleton	W.Va.	MA-7b-6	218,112	Investigated or Planned
P-11	*South Branch	Grant, Pendleton	W.Va.	MA-7b-7	225,920	Investigated or Planned
P-12	*Mill Creek	Grant, Pendleton	W.Va.	MA-7b-3	62,080	Investigated or Planned

TABLE XLV (continued)

Upstream Watersheds - Identification and Location

Map No.	Watershed Name	LOCATION Counties	State	USDA Atlas of River Basin Number	Drainage Area (Acres)	Status 1/
WATER SUB-REGION B (continued)						
P-19	*Little Cacapon River	Hampshire	W.Va.	MA-7-3	174,304	Investigated or Planned
P-20	*North River	Hardy, Hampshire	W.Va.	MA-7-6	131,136	Investigated or Planned
P-22	*Lost River	Hardy	W.Va.	MA-7-8	158,400	Investigated or Planned
P-23	Cacapon River	Hardy, Hampshire	W.Va.	MA-7-7	144,064	Investigated or Planned
P-24	*Sleepy Creek	Morgan, Frederick (Va.)	W.Va.	MA-7-13	85,760	Investigated or Planned
P-41	*Opequon Creek	Berkeley, Frederick (Va.)	W.Va.	MA-7-18	217,472	Investigated or Planned
WATER SUB-REGION C						
2	Johns Creek	Craig, Giles	Va.	MA-10	65,000	Authorized for Installation
10	*Back Creek	Bath, Highland	Va.	MA-10	90,125	Investigated or Planned
13	*Calfpasture River	Augusta, Bath, Rockbridge	Va.	MA-10	119,275	Investigated or Planned
8	*Catawba Creek	Botetourt, Roanoke	Va.	MA-10	73,775	Investigated or Planned
7	*Cowpasture River	Alleghany, Bath, Highland, Pendleton (W.Va.)	Va.	MA-10	248,355	Investigated or Planned
20	*Dunlap Creek	Alleghany	Va.	MA-10	77,955	Investigated or Planned
31	*Jackson River 2 4/	Bath	Va.	MA-10	100,175	Investigated or Planned
33	Jackson River 4	Alleghany, Bath	Va.	MA-10	62,975	Investigated or Planned
34	*Jackson River 5	Alleghany, Bath	Va.	MA-10	73,275	Investigated or Planned
47	*Ogle Creek	Alleghany	Va.	MA-10	29,335	Investigated or Planned
49	*Potts Creek	Alleghany, Craig, Monroe (W.Va.)	Va.	MA-10	110,901	Investigated or Planned
WATER SUB-REGION D						
2	Barber Creek	Barrow, Oconee	Ga.	SAG-12b	26,899	Completed
21	Marbury Creek	Barrow, Oconee	Ga.	SAG-12b	16,394	Completed
64	Little Sandy and Trail Creek	Clarke, Jackson, Madison	Ga.	SAG-12b	27,276	Authorized for Installation
23	Middle Oconee-Walnut Cr.	Hall, Jackson	Ga.	SAG-12b	91,700	Authorized for Installation
31	Sandy Creek	Jackson, Madison	Ga.	SAG-12b	21,000	Authorized for Installation
33	South Fork Broad River	Clarke, Madison, Oglethorpe	Ga.	SAG-10c	92,990	Authorized for Installation
34	South River	Clarke, Madison	Ga.	SAG-10c	59,875	Authorized for Installation
60	*North Oconee River	Hall, Jackson	Ga.	SAG-12b	57,350	Potential - WRS
1	Abbotts Creek 2/	Davidson, Forsyth, Guilford, Randolph	N.C.	SAG-5	115,300	Authorized for Installation
2	Deep Creek	Yadkin	N.C.	SAG-5	79,450	Authorized for Installation
9	Dutchman Creek	Davie, Iredell, Yadkin	N.C.	SAG-5	81,500	Authorized for Installation
12	Little Yadkin River	Forsyth, Stokes, Surry	N.C.	SAG-5	40,000	Authorized for Installation
4	Muddy Creek	Burke, McDowell	N.C.	SAG-6a	64,000	Authorized for Installation
5	Stewarts-Lovills Creek	Carroll (Va.), Surry	N.C.	SAG-5	72,000	Authorized for Installation
6	Town Fork Creek	Forsyth, Stokes	N.C.	MA-12a	84,521	Authorized for Installation
8	*Camp-Cane Creek	McDowell, Rutherford	N.C.	SAG-6b1	27,850	Investigated or Planned
15	*Turner Creek	Davie, Yadkin	N.C.	SAG-5	6,900	Investigated or Planned
17	*Hunting-Bear Creek	Davie, Iredell, Wilkes, Yadkin	N.C.	SAG-5a	145,725	Potential - WRS
19	*Upper South Yadkin	Alexander, Iredell	N.C.	SAG-5a	35,700	Potential - WRS

TABLE XLV (continued)

Upstream Watersheds - Identification and Location

Map No.	Watershed Name	LOCATION: Counties	State	USDA Atlas of River Basin Number	Drainage Area (Acres)	Status 1/
	WATER SUB-REGION D (continued)					
1	Brushy Creek	Anderson, Pickens	S.C.	SAG-6b2	23,512	Completed
6	Huff Creek	Greenville	S.C.	SAG-6b2	21,787	Completed
2	Twelve Mile Creek	Pickens	S.C.	SAG-10b	67,346	Completed
3	Big Creek	Anderson	S.C.	SAG-6b2	13,279	Authorized for Installation
4	Broad Mouth Creek	Anderson	S.C.	SAG-6b2	18,600	Authorized for Installation
5	Coneross Creek	Oconee	S.C.	SAG-10b	43,300	Authorized for Installation
13	Georges Creek	Pickens	S.C.	SAG-6b2	20,347	Authorized for Installation
17	South Tyger River	Greenville	S.C.	SAG-6b1a	38,147	Authorized for Installation
7	Thicketty Creek	Cherokee, Spartanburg	S.C.	SAG-6b1	74,640	Authorized for Installation
8	Three and Twenty Creek	Anderson, Pickens	S.C.	SAG-10b	47,590	Authorized for Installation
9	Wilson Creek	Abbeville, Anderson	S.C.	SAG-10	23,320	Authorized for Installation
15	*Little Beaver Dam	Anderson, Oconee	S.C.	SAG-10b	24,270	Investigated or Planned
19	*Cherokee Creek	Cherokee	S.C.	SAG-6b1	14,760	Potential - WRS
20	*Eighteen Mile Creek	Anderson, Oconee, Pickens	S.C.	SAG-10b	33,000	Potential - WRS
22	*North and Middle Tyger River	Greenville, Spartanburg	S.C.	SAG-6b1a	108,415	Potential - WRS
23	*South Pacolet River	Greenville, Spartanburg	S.C.	SAG-6b1	57,990	Potential - WRS
	WATER SUB-REGION E					
1	Bristows Creek	Etowah	Ala.	SAG-34g2	16,608	Completed
3	Little New River	Fayette, Marion	Ala.	SAG-34a	32,506	Completed
11	High Pine Creek	Chambers, Randolph	Ala.	SAG-33b	51,590	Completed
6	Blue Eye Creek	Calhoun, Talladega	Ala.	SAG-33a	14,131	Authorized for Installation
7	Cheaha	Clay, Cleburne, Talladega	Ala.	SAG-33a	78,000	Authorized for Installation
8	Choccolocco Creek	Calhoun, Clay, Cleburne, Talladega	Ala.	SAG-33a	240,600	Authorized for Installation
9	Crooked Creek	Clay, Randolph	Ala.	SAG-33b	63,558	Authorized for Installation
13	Ketchepedrake Creek	Clay, Cleburne, Randolph	Ala.	SAG-33b	35,110	Authorized for Installation
14	Lost Creek	Carroll (Ga.), Cleburne	Ala.	SAG-33b	17,139	Authorized for Installation
15	Mill Creek	Autauga, Elmore	Ala.	SAG-33	6,790	Authorized for Installation
16	Terrapin Creek	Calhoun, Cherokee, Cleburne, Haralson (Ga.), Polk (Ga.)	Ala.	SAG-33a	183,675	Authorized for Installation
20	*Cahulga Creek	Cleburne	Ala.	SAG-33b	12,030	Investigated or Planned
28	*Dyne Creek	Cleburne	Ala.	SAG-33b	15,200	Potential - WRS
22	*Sipsey Creek	Itawamba (Miss.), Lamar, Marion, Monroe (Miss.)	Ala.	SAG-34c	144,200	Potential - WRS
30	*Jacks and Socapotay	Coosa	Ala.	SAG-33a	48,100	Potential - WRS
33	*Little Sandy Creek	Tuscaloosa	Ala.	SAG-34c	40,500	Potential - WRS
34	*Luxapalila Creek	Fayette, Lamar, Marion, Pickens	Ala.	SAG-34	196,400	Potential - WRS
35	*Mahan Creek	Bibb, Chilton	Ala.	SAG-33	27,000	Potential - WRS
38	*Mill Creek	Cherokee	Ala.	SAG-33a3	49,900	Potential - WRS
37	*Wehadkee Creek	Randolph	Ala.	SAG-26a	20,500	Potential - WRS
1	Amicalola Creek	Lumpkin, Pickens, Cherokee, Dawson, Forsyth	Ga.	SAG-33a2	80,294	Completed
3	Hazel Creek	Habersham	Ga.	SAG-26a	19,560	Completed
4	Hightower Creek	Towns	Ga.	OR-21-5	22,950	Completed

TABLE XLV (continued)

Upstream Watersheds - Identification and Location

Map No.	Watershed Name	LOCATION Counties	State	USDA Atlas of River Basin Number	Drainage Area (Acres)	Status 1/
WATER SUB-REGION E (continued)						
5	Jacks River	Fannin, Murray, Polk	Ga.	SAG-33a1	79,258	Completed
24	Mill Creek	Walker, Whitfield	Ga.	SAG-33a1	32,604	Completed
6	North Fork Broad River	Franklin, Stephens	Ga.	SAG-10c	40,598	Completed
7	Sautee Creek	Habersham, White	Ga.	SAG-26a	20,000	Completed
8	Settingdown Creek	Cherokee, Forsyth	Ga.	SAG-33a2	34,070	Completed
9	Allatoona Creek	Bartow, Cherokee, Cobb, Paulding	Ga.	SAG-33a2	65,018	Authorized for Installation
40	Big Cedar Creek	Floyd, Polk	Ga.	SAG-33a	133,205	Authorized for Installation
10	Cartecay River	Dawson, Fannin, Gilmer, Pickens	Ga.	SAG-33a1	89,750	Authorized for Installation
11	Ellijay River	Fannin, Gilmer	Ga.	SAG-33a1	61,100	Authorized for Installation
43	Euharlee Creek	Bartow, Floyd, Haralson, Paulding, Polk,	Ga.	SAG-33a2	108,919	Authorized for Installation
12	Etowah River Reach	Dawson, Fannin, Forsyth, Lumpkin	Ga.	SAG-33a2	128,662	Authorized for Installation
13	Grove River	Banks, Jackson	Ga.	SAG-10c	55,600	Authorized for Installation
14	Haynes Creek-Brushy Fork	Gwinnett, Rockdale, Walton	Ga.	SAG-12a	20,000	Authorized for Installation
15	Head of Little Tennessee River	Macon (N.C.), Rabun,	Ga.	OR-21-3	89,600	Authorized for Installation
16	Hiawassee River	Towns	Ga.	OR-21-5	37,685	Authorized for Installation
17	Little River	Cherokee, Cobb, Forsyth, Fulton	Ga.	SAG-33a2	67,442	Authorized for Installation
48	Little River	Haralson	Ga.	SAG-33b	28,477	Authorized for Installation
18	Little Tallapoosa River	Carroll, Haralson	Ga.	SAG-33b	62,516	Authorized for Installation
19	Long Swamp Creek	Cherokee, Dawson, Pickens	Ga.	SAG-33a2	56,974	Authorized for Installation
20	Lower Little Tallapoosa	Carroll, Haralson, Heard	Ga.	SAG-33b	133,218	Authorized for Installation
22	Middle Fork Broad River	Banks, Franklin, Habersham, Stephens	Ga.	SAG-10c	50,829	Authorized for Installation
25	Mill-Canton Creek	Cherokee, Forsyth	Ga.	SAG-33a2	83,388	Authorized for Installation
26	Mountaintown Creek	Fannin, Gilmer	Ga.	SAG-33a1	56,256	Authorized for Installation
27	Noonday Creek	Cherokee, Cobb	Ga.	SAG-33a2	32,253	Authorized for Installation
28	North Broad River	Franklin, Hart, Stephens	Ga.	SAG-10c	46,470	Authorized for Installation
53	Pine Log Tributary	Bartow, Cherokee, Gordon	Ga.	SAG-33a1	83,900	Authorized for Installation
29	Pumpkinvine Creek	Bartow, Cobb, Paulding,	Ga.	SAG-33a2	103,793	Authorized for Installation
30	Raccoon Creek	Bartow, Paulding, Polk,	Ga.	SAG-33a2	39,471	Authorized for Installation
54	Sallacoa Creek Area	Bartow, Cherokee, Gordon, Pickens	Ga.	SAG-33a1	76,600	Authorized for Installation
32	Sharp Mountain Creek	Cherokee, Pickens	Ga.	SAG-33a2	59,428	Authorized for Installation
35	Stamp-Shoal Creek	Bartow, Cherokee, Pickens	Ga.	SAG-33a2	97,903	Authorized for Installation
36	Talking Rock Creek	Gilmer, Gordon, Murray, Pickens	Ga.	SAG-33a1	120,896	Authorized for Installation
46	*Hudson River	Banks, Franklin, Madison	Ga.	SAG-10c	126,510	Investigated or Planned
55	*Suwanee Creek	Gwinnett, Hall	Ga.	SAG-26a	33,623	Investigated or Planned
56	*Tesnatee Creek	Lumpkin, White	Ga.	SAG-26a	45,194	Investigated or Planned
59	*Mill Creek Area	Murray	Ga.	SAG-33a1	41,945	Potential - WRS
62	*Wahoo-Little River	Hall, Lumpkin, White	Ga.	SAG-26a	75,595	Potential - WRS
63	*Young Cane Creek	Union	Ga.	OR-21-5	20,745	Potential - WRS

TABLE XLV (continued)

Upstream Watersheds - Identification and Location

Map No.	Watershed Name	LOCATION Counties	State	USDA Atlas of River Basin Number	Drainage Area (Acres)	Status 1/
	WATER SUB-REGION E (continued)					
1	Shammack Creek	Kemper	Miss.	SAG-34f	10,573	Completed
2	Cane Creek	Tippah, Union	Miss.	LM-6a	17,000	Authorized for Installation
3	Chiwapa Creek	Lee, Pontotoc	Miss.	SAG-34b	101,328	Authorized for Installation
4	Chuquatonchee Creek	Clay, Chickasaw, Pontotoc	Miss.	SAG-34d	136,832	Authorized for Installation
5	Coldwater River	Benton, Desota, Marshall	Miss.	LM-6a1	145,522	Authorized for Installation
6	Cypress and Puss Cuss Cr.	LaFayette, Pontotoc	Miss.	LM-6a	56,184	Authorized for Installation
7	Duncan-Cane Creek	Pontotoc	Miss.	LM-6a	19,721	Authorized for Installation
8	Fair Creek	Chickasaw	Miss.	LM-6a2	3,740	Authorized for Installation
9	Grays Creek	Benton	Miss.	LM-4	23,616	Authorized for Installation
10	Hell Creek	Tippah, Union	Miss.	LM-6a	25,830	Authorized for Installation
11	Houlka Creek	Chicaksaw	Miss.	SAG-34d	146,560	Authorized for Installation
12	Little Spring- Ochewalla Cr.	Marshall	Miss.	LM-6a	32,280	Authorized for Installation
13	Locks Creek	Benton, Union	Miss.	LM-6a	20,995	Authorized for Installation
14	Lower Tippah River	Benton, Marshall, Tippah	Miss.	LM-6a	105,212	Authorized for Installation
15	Mill Creek	Marshall, Union	Miss.	LM-6a	20,336	Authorized for Installation
16	Muddy Creek	Tippah	Miss.	LM-2	80,794	Authorized for Installation
17	North Tippah Creek	Tippah	Miss.	LM-6a	17,000	Authorized for Installation
18	Oaklimeter Creek	Union, Benton, Marshall, Tippah	Miss.	LM-6a	63,232	Authorized for Installation
19	Old Town Creek (Towncreek)	Lee, Pontotoc, Prentiss, Union	Miss.	SAG-34b	246,976	Authorized for Installation
20	Pigeon Roost Creek	Desoto, Marshall	Miss.	LM-6a1	151,168	Authorized for Installation
21	Tallahaga Creek	Choctaw, Winston	Miss.	SAG-37	79,360	Authorized for Installation
22	Tuscumbia Creek	Alcorn, Prentiss	Miss.	LM-2	223,168	Authorized for Installation
23	Upper Skuna River	Calhoun, Chickasaw, Pontotoc	Miss.	LM-6a2	100,380	Authorized for Installation
24	Upper Tippah Creek	Benton, Tippah	Miss.	LM-6a	63,104	Authorized for Installation
25	West Hatchie Creek	Tippah	Miss.	LM-2	47,874	Authorized for Installation
26	*Brown Creek	Prentiss	Miss.	SAG-34a	94,300	Investigated or Planned
27	*Line Creek	Clay, Chickasaw, Webster	Miss.	SAG-34d	127,360	Investigated or Planned
A-13 & M-35	*Scooba and Bodka Creek	Green, Kemper (Miss.), Ala.		SAG-34b	169,280	Investigated or Planned
A-18 & M-21	*Little Buttahatchia River	Lamar, Marion, Monroe, (Miss.)	Ala.	SAG-34c	122,368	Investigated or Planned
A-20 & M-24B	*Yellow Creek	Fayette, Lamar, Lowndes (Miss.)	Ala.	SAG-34	230,464	Investigated or Planned
A-25	*Woolbank, Beaver, Blubber Cr.	Pickens	Ala.	SAG-34	92,864	Investigated or Planned
A-26	*Lubbub Creek	Fayette, Pickens	Ala.	SAG-34	186,368	Investigated or Planned
A-27	*New River & Barrow Creek	Fayette, Marion, Walker, Winston	Ala.	SAG-34e	164,928	Investigated or Planned
M-2	*Twenty-Mile, Donovan Cr.	Itawamba, Lee, Prentiss	Miss.	SAG-34a	144,192	Investigated or Planned
M-4	*MacKay's Creek	Itawamba, Prentiss, Tishomingo	Miss.	SAG-34a	93,440	Investigated or Planned
M-7	*Mantachie Creek	Lee, Monroe, Itawamba	Miss.	SAG-34a	122,240	Investigated or Planned

TABLE XLV (continued)

Upstream Watersheds - Identification and Location

Map No.	Watershed Name	Counties	State	USDA Atlas of River Basin Number	Drainage Area (Acres)	Status 1/
WATER SUB-REGION E (continued)						
M-8	*Reed Cummings	Itawamba	Miss.	SAG-34a	78,528	Investigated or Planned
M-9 & A-15	* Bull Mountain Creek	Monroe, Itawamba, Franklin, Marion	Miss.	SAG-34a	234,816	Investigated or Planned
M-11	*Tallabinnela Creek	Chickasaw, Lee, Monroe, Pontotoc	Miss.	SAG-34b	56,576	Investigated or Planned
M-12	*Cowpenna Creek	Lee, Monroe, Itawamba	Miss.	SAG-34b	41,472	Investigated or Planned
M-14	*Mattubby & James Creek	Chickasaw, Monroe	Miss.	SAG-34	124,160	Investigated or Planned
M-15	*Weanners & Stanefer Creek	Monroe	Miss.	SAG-34	122,496	Investigated or Planned
M-19	*Hang Kettle & Town Creek	Monroe, Lowndes	Miss.	SAG-34	56,384	Investigated or Planned
M-20	*McKinley's Creek	Monroe	Miss.	SAG-34	64,384	Investigated or Planned
M-22	*Trim Cane Creek	Clay, Oktibbeha, Webster	Miss.	SAG-34d	115,328	Investigated or Planned
M-23	*Spring & Town Creek	Clay, Monroe	Miss.	SAG-34d	69,184	Investigated or Planned
M-24	*Stinson Creek	Lowndes	Miss.	SAG-34	51,520	Investigated or Planned
M-24c & A-23a	*Lower Luxapalila Creek	Lowndes, Pickens (Ala.)	Miss.	SAG-34	80,256	Investigated or Planned
M-25	*Catalpa Creek	Clay, Lowndes, Oktibbeha	Miss.	SAG-34d	83,648	Investigated or Planned
M-26	*Cypress & Talking Warrior	Choctaw, Oktibbeha	Miss.	SAG-34f	93,120	Investigated or Planned
M-27	*McCowers Creek	Lowndes, Noxubee	Miss.	SAG-34	171,392	Investigated or Planned
M-28 & A-23	*Ellis, Nash & Kincade Creek	Lowndes, Pickens (Ala.)	Miss.	SAG-34	101,760	Investigated or Planned
M-31	*Browning and W. Water Cr.	Lowndes, Noxubee, Oktibbeha	Miss.	SAG-34f	104,896	Investigated or Planned
A-14, M-32 & M-34	*Bogue Chitto and Wood-ward Creek	Noxubee	Miss.	SAG-34f	194,816	Investigated or Planned
WATER SUB-REGION F						
3	Conewango Creek	Cattaraugus, Chautauqua	N.Y.	OR-1a	190,080	Authorized for Installation
5	Ischua Creek	Cattaraugus	N.Y.	OR-1	74,900	Authorized for Installation
13	*Great Valley	Cattaraugus	N.Y.	OR-1	90,200	Potential - WRS
15	*Little Valley	Cattaraugus	N.Y.	OR-1	30,300	Potential - WRS
8	*Short Creek	Harrison, Jefferson	Ohio	Ohio	81,280	Investigated or Planned
2	Mill Run	Crawford	Pa.	OR-1b	7,814	Completed
3	North Fork Cowqnesque River	Potter, Steuben (N.Y.),	Pa.	MA-5a2a	7,650	Completed
4	Saul -Mathay	Mercer	Pa.	OR-3a1	3,940	Completed
7	Dunlap Creek	Fayette	Pa.	OR-2	10,590	Authorized for Installation
9	Harmon Creek	Washington, Brooke (W.Va.), Hancock (W.Va.)	Pa.	Ohio	24,350	Authorized for Installation
12	Little Shenango River	Crawford, Mercer	Pa.	OR-3a1	72,738	Authorized for Installation
18	Oil Creek	Crawford, Erie, Venango, Warren	Pa.	OR-1	112,000	Authorized for Installation
19	Sandy Creek	Crawford, Mercer	Pa.	OR-1	42,000	Authorized for Installation
11	*Jacobs Creek	Fayette, Westmoreland,	Pa.	OR-2c	62,500	Investigated or Planned

TABLE XLV (continued)

Upstream Watersheds - Identification and Location

Map No.	Watershed Name	LOCATION Counties	State	USDA Atlas of River Basin Number	Drainage Area (Acres)	Status 1/
	WATER SUB-REGION F (continued)					
54	*Blacklick Creek	Cambria, Indiana	Pa.	OR-1d	250,000	Potential - WRS
55	*Brokenstraw Creek	Chautauqua (N.Y.), Crawford, Erie, Warren	Pa.	OR-1	215,700	Potential - WRS
25	*Connoquenessing Creek	Allegheny, Butler	Pa.	OR-3b	207,300	Potential - WRS
56	*French Creek (Upper)	Chautauqua (N.Y.), Erie	Pa.	OR-1b	118,000	Potential - WRS
57	*Indian Creek	Fayette, Westmoreland,	Pa.	OR-2c	79,400	Potential - WRS
58	*LeBoeuf Creek	Erie	Pa.	OR-1b	41,500	Potential - WRS
59	*Mahoning Creek	Armstrong, Clearfield, Indiana, Jefferson	Pa.	OR-1	268,800	Potential - WRS
60	*Oswago Creek	Allegany (N.Y.), Cattaraugus (N.Y.), McKean, Potter	Pa.	OR-1	158,700	Potential - WRS
61	*Potato Creek	McKean	Pa.	OR-1	144,700	Potential - WRS
62	*Raccoon Creek	Allegheny, Beaver, Washington	Pa.	Ohio	116,600	Potential - WRS
63	*Sandy Lick Creek	Clearfield, Jefferson	Pa.	OR-1	148,000	Potential - WRS
64	*Sewickley Creek	Westmoreland	Pa.	OR-2c	106,300	Potential - WRS
67	*Sugar Creek	Crawford, Venango	Pa.	OR-1b	106,250	Potential - WRS
68	*Tionesta Creek	Elk, Forest, McKean, Warren	Pa.	OR-1	205,000	Potential - WRS
69	*Turtle Creek	Allegheny, Westmoreland	Pa.	OR-2	93,800	Potential - WRS
70	*Upper Allegheny River	McKean, Potter	Pa.	OR-1	145,500	Potential - WRS
71	*Upper Loyalhanna Creek	Westmoreland	Pa.	OR-1d	135,360	Potential - WRS
72	*West Branch Clarion River	Elk, McKean	Pa.	OR-1c	60,625	Potential - WRS
4	Salem Fork-Ten Mile Creek	Harrison	W.Va.	OR-2a1	5,325	Completed
5	Upper Grave Creek	Marshall	W.Va.	Ohio	4,920	Completed
14	Polk Creek	Lewis	W.Va.	OR-2a1	7,280	Authorized for Installatio
18	Upper Deckers Creek	Monongalia, Preston	W.Va.	OR-2	19,940	Authorized for Installatio
69	Upper Buffalo Creek	Marion	W.Va.	OR-2	45,914	Authorized for Installatio
76	Wheeling Creek	Marshall, Ohio, Greene (Pa.), Washington (Pa.)	W.Va.	Ohio	191,180	Authorized for Installatio
63	*Stonecoal Creek	Lewis, Upshur	W.Va.	OR-2a1	25,620	Investigated or Planned
64	*Ten Mile Creek	Harrison	W.Va.	OR-2a1	9,700	Investigated or Planned
79	*Elk Creek	Barbour, Harrison, Upshur	W.Va.	OR-2a1	76,685	Potential - WRS
81	*Kings Creek	Hancock, Washington (Pa.)	W.Va.	Ohio	31,900	Potential - WRS
82	*Limestone Run	Harrison, Marion	W.Va.	OR-2a1	6,570	Potential - WRS
84	*Paw Paw Creek	Marion, Monongalia	W.Va.	OR-2	26,450	Potential - WRS
85	*Prickett Creek	Marion, Taylor	W.Va.	OR-2	15,582	Potential - WRS
86	*Sandy Creek	Barbour, Preston, Taylor	W.Va.	OR-2a	56,350	Potential - WRS
87	*Simpson Creek	Barbour, Harrison, Taylor	W.Va.	OR-2a1	46,559	Potential - WRS
88	*Three Fork Creek	Monongalia, Preston, Taylor	W.Va.	OR-2a	64,000	Potential - WRS
89	*Upper Middle Island Creek	Doddridge	W.Va.	Ohio	72,350	Potential - WRS
91	Upper West Fork River	Lewis, Upshur	W.Va.	OR-2a1	18,500	Potential - WRS

TABLE XLV (continued)

Upstream Watersheds - Identification and Location

Map No.	Watershed Name	LOCATION: Counties	State	USDA Atlas of River Basin Number	Drainage Area (Acres)	Status 1/
WATER SUB-REGION G						
7	*Grassy Creek	Morgan	Ky.	OR-12	33,500	Investigated or Planned
8	*Little Fork of Little Sandy River	Carter, Elliott, Lawrence	Ky.	Ohio	83,200	Investigated or Planned
16	*East Fork Little Sandy	Boyd, Carter, Greenup, Lawrence	Ky.	Ohio	98,600	Potential - WRS
22	*Triplett Creek	Rowan	Ky.	OR-12	119,700	Potential - WRS
25	Upper Licking River	Magoffin	Ky.	OR-12	89,600	Investigated or Planned
1	Buffalo Creek	Guernsey, Noble	Ohio	OR-4c	32,150	Authorized for Installation
2	Margaret Creek	Athens	Ohio	OR-6	38,600	Authorized for Installation
3	Rush Creek	Fairfield, Hocking, Perry	Ohio	OR-6	151,462	Authorized for Installation
4	West Fork Duck Creek	Guernsey, Noble, Washington	Ohio	Ohio	68,378	Authorized for Installation
7	*Pine Creek	Jackson, Lawrence, Scioto	Ohio	Ohio	118,400	Investigated or Planned
9	*Federal Valley	Athens, Morgan, Washington	Ohio	OR-6	92,740	Potential - WRS
10	*Little Salt Creek	Jackson, Pike, Ross	Ohio	OR-10	88,770	Potential - WRS
11	*Little Scioto River	Jackson, Pike, Scioto	Ohio	Ohio	148,860	Potential - WRS
12	*Moxahala-Jonathan Creek	Licking, Morgan, Muskingum, Perry	Ohio	OR-4	192,450	Potential - WRS
13	*O'Bannon Creek	Clermont, Warren	Ohio	OR-11	37,440	Potential - WRS
14	*Upper White Oak Creek	Brown, Highland	Ohio	Ohio	149,950	Potential - WRS
15	*Wakatomika Creek	Coshocton, Knox, Licking, Muskingum	Ohio	OR-4	149,670	Potential - WRS
16	*Wolf Creek	Morgan, Washington	Ohio	OR-4	147,780	Potential - WRS
1	Back Creek	Pulaski	Va.	OR-7a	22,340	Completed
61	South Fork Roanoke River	Floyd, Montgomery, Roanoke	Va.	MA-12	92,416	Authorized for Installation
42	*Little Stony Creek 4/	Giles, Mercer (W.Va.)	Va.	OR-7a	15,432	Investigated or Planned
74	*Mill Creek	Giles	Va.	OR-7a	4,425	Investigated or Planned
48	*Peak Creek	Pulaski, Wythe	Va.	OR-7a	60,340	Investigated or Planned
76	*Headwaters Holston River	Bland, Smyth, Tazewell	Va.	OR-21-2	150,270	Potential - WRS
1	Bonds Creek	Ritchie	W.Va.	OR-5	9,435	Completed
2	Dave's Fork-Christian's Fork	Mercer	W.Va.	OR-7a	4,154	Completed
3	Marlin Run	Pocahontas	W.Va.	OR-7al	1,035	Completed
7	Big Ditch Run	Webster	W.Va.	OR-7b	5,730	Authorized for Installation
8	Blakes and Armours at Nitro	Kanawha, Putnam	W.Va.	OR-7	3,680	Authorized for Installation
9	Brush Creek	Mercer	W.Va.	OR-7a	22,393	Authorized for Installation
13	Pecks Run	Barbour, Upshur	W.Va.	OR-2a	8,210	Authorized for Installation
15	Saltlick Creek	Braxton	W.Va.	OR-5	31,683	Authorized for Installation
16	Shooks Run	Barbour	W.Va.	OR-2a	1,924	Authorized for Installation
19	*Ansted Creek	Fayette	W.Va.	OR-7a	1,285	Investigated or Planned
21	*Beaver Creek	Nicholas, Webster	W.Va.	OR-7b	24,864	Investigated or Planned
22	*Grassy Creek	Nicholas	W.Va.	OR-7b	13,220	Investigated or Planned
25	*Cherry River	Greenbrier, Nicholas, Pocahontas, Webster	W.Va.	OR-7b	104,774	Investigated or Planned
29	*Elk-Two Mile Creek	Kanawha	W.Va.	OR-7c	8,450	Investigated or Planned
32	*Fourpole Creek	Cabell	W.Va.	Ohio	9,364	Investigated or Planned
31	*Georges Creek	Kanawha	W.Va.	OR-7	1,580	Investigated or Planned
33	*Glade Creek (Upper)	Raleigh	W.Va.	OR-7a	69,805	Investigated or Planned
36	*Howard Creek	Greenbrier	W.Va.	OR-7al	58,714	Investigated or Planned
38	*Kanawha-Two Mile	Kanawha	W.Va.	OR-7	15,370	Investigated or Planned
39	*Kellys Creek	Kanawha	W.Va.	OR-7	15,540	Investigated or Planned

TABLE XLV (continued)

Upstream Watersheds - Identification and Location

Map No.	Watershed Name	LOCATION: Counties	State	USDA Atlas of River Basin Number	Drainage Area (Acres)	Status 1/
WATER SUB-REGION G (continued)						
[illegible]	*Lick Branch	Kanawha	W.Va.	OR-7	1,090	Investigated or Planned
42	*Meadow Creek	Fayette, Summers	W.Va.	OR-7a	18,140	Investigated or Planned
52	*Piney Creek	Raleigh	W.Va.	OR-7a	87,810	Investigated or Planned
59	*Rocky Fork	Kanawha, Putnam	W.Va.	OR-7	12,180	Investigated or Planned
61	*Slack Branch	Clay, Kanawha	W.Va.	OR-7c	5,100	Investigated or Planned
65	*Tributary of Greenbrier Gypsy Hill	Greenbrier	W.Va.	OR-7a1	694	Investigated or Planned
72	*Upper Meadow River	Fayette, Greenbrier, Summers	W.Va.	OR-7b	131,540	Investigated or Planned
90	*Mill Creek (Upper)	Jackson, Roane	W.Va.	Ohio	123,250	Investigated or Planned
78	*Slaughter Creek	Kanawha	W.Va.	OR-7	8,370	Investigated or Planned
31	*Wertz Hollow	Kanawha	W.Va.	OR-7	420	Investigated or Planned
80	*French Creek	Upshur	W.Va.	OR-2a	31,414	Potential - WRS
83	*Mate Creek	Mingo	W.Va.	OR-9b	10,480	Potential - WRS
92	*Big Creek	Boone, Logan	W.Va.	OR-8	17,320	Potential - WRS
93	*Upper Buckhannon River	Randolph, Upshur	W.Va.	OR-2a	94,780	Potential - WRS
WATER SUB-REGION H						
2	Red River (Stillwater Cr.)	Wolfe	Ky.	OR-14	15,582	Completed
3	Upper Green	Lincoln	Ky.	OR-16	24,275	Completed
4	Buck Creek	Lincoln	Ky.	OR-20	36,677	Authorized for Installation
6	Fox Creek	Fleming	Ky.	OR-12	50,400	Authorized for Installation
12	*Redlick Creek	Estill, Jackson, Madison	Ky.	OR-14	44,700	Investigated or Planned
24	*Upper Howard Creek	Clark	Ky.	OR-14	16,670	Investigated or Planned
17	*Hanging Fork Creek	Lincoln	Ky.	OR-14	61,300	Potential - WRS
21	*Silver Creek	Madison	Ky.	OR-14	80,640	Potential - WRS
23	*Upper Red River	Morgan, Wolfe	Ky.	OR-14	40,700	Potential - WRS
WATER SUB-REGION I						
1	Meadow Creek	Wayne	Ky.	OR-20	9,862	Completed
11	Mill Creek	Monroe	Ky.	OR-16a	29,179	Authorized for Installation
10	*Marsh Creek	McCreary, Scott (Tenn.),	Ky.	OR-20	22,980	Investigated or Planned
15	*Casey Creek	Adair, Casey	Ky.	OR-16	59,300	Potential - WRS
18	*Marrowbone Creek	Cumberland, Metcalfe, Monroe	Ky.	OR-20	55,552	Potential - WRS
19	*Richland Creek	Knox	Ky.	OR-20	47,350	Potential - WRS
20	*Russell Creek	Adair, Green, Russell	Ky.	OR-16	184,960	Potential - WRS
6	Proctor Creek	Clay	Tenn.	OR-20	8,465	Completed
1	Jennings Creek	Clay, Jackson, Macon	Tenn.	OR-20	46,150	Authorized for Installation
3	Line Creek	Clay, Macon, Monroe (Ky.)	Tenn.	OR-16a	40,330	Authorized for Installation
4	Mill Creek	Clay, Overton	Tenn.	OR-20	24,585	Authorized for Installation
14	*Roaring River	Jackson, Overton, Putnam	Tenn.	OR-20	194,300	Investigated or Planned
15	*Smith Fork Creek	Cannon, Dekalb, Smith, Wilson	Tenn.	OR-20d	153,750	Investigated or Planned

TABLE XLV (continued)

Upstream Watersheds - Identification and Location

Map No.	Watershed Name	LOCATION Counties	State	USDA Atlas of River Basin Number	Drainage Area (Acres)	Status 1/
WATER SUB-REGION I (continued)						
21	*Calfkiller River	Cumberland, Putnam, White	Tenn.	OR-20d	123,000	Potential - WRS
23	*Putnam-Cane Creek	Putnam	Tenn.	OR-20d	15,100	Potential - WRS
25	Little Indian Creek and Buffalo Creek	Putnam	Tenn.	OR-20d	22,800	Potential - WRS
28	*Salt Lick Creek	Clay, Macon, Monroe (Ky.)	Tenn.	OR-16a	75,225	Potential - WRS
WATER SUB-REGION J						
2	Clear Creek	Jackson	Ala.	OR-21	11,800	Completed
4	Little Paint Creek	Jackson, Marshall	Ala.	OR-21	35,600	Completed
19	Big Coon Creek	Jackson	Ala.	OR-21	33,094	Authorized for Installation
5	Big Nance Creek	Lawrence	Ala.	OR-21	118,925	Authorized for Installation
10	Crowdabout Creek 2/	Cullman, Lawrence, Morgan	Ala.	OR-21	31,705	Authorized for Installation
12	Hurricane Creek	Jackson, Madison	Ala.	OR-21	45,566	Authorized for Installation
17	Town Creek	Colbert, Franklin, Lawrence	Ala.	OR-21	161,000	Authorized for Installation
26	*Cane Creek	Colbert	Ala.	OR-21	38,400	Potential - WRS
27	*Cypress Creek	Lauderdale	Ala.	OR-21	135,000	Potential - WRS
31	*Limestone Creek	Limestone, Madison	Ala.	OR-21	92,100	Potential - WRS
32	*Little Bear Creek	Colbert, Franklin	Ala.	OR-21	45,600	Potential - WRS
58	*Headwaters Chattooga River	Chattooga, Walker	Ga.	SAG-33a3	105,400	Potential - WRS
61	*Peavine Creek	Catoosa, Walker	Ga.	OR-21	21,910	Potential - WRS
3	Mud Creek 2/	Henderson	N.C.	OR-21-1	71,850	Authorized for Installation
7	*Cane Creek	Mitchell	N.C.	OR-21-1a	19,300	Investigated or Planned
10	French Broad River 3/	Henderson, Transylvania	N.C.	OR-21-1	217,190	Investigated or Planned
18	*Tallulah Creek 4/	Graham	N.C.	OR-21-3	39,800	Potential - WRS
10	Crow Creek	Franklin, Jackson (Ala.), Marion	Tenn.	OR-21	101,500	Authorized for Installation
2	Lick Creek 2/	Greene, Washington	Tenn.	OR-21-1	168,392	Authorized for Installation
5	Pine Creek	Scott	Tenn.	OR-20b	16,800	Authorized for Installation
7	Roarks Cove	Franklin	Tenn.	OR-21-6	12,800	Authorized for Installation
8	Shady Valley	Johnson	Tenn.	OR-21-2a	12,025	Authorized for Installation
9	*Boiling Fork Creek	Franklin	Tenn.	OR-21-6	65,200	Investigated or Planned
12	*Hickory Creek	Coffee, Grundy, Warren	Tenn.	OR-20d-1	81,000	Investigated or Planned
13	*Horse Creek	Greene, Hawkins, Sullivan, Washington,	Tenn.	OR-21-2a	29,500	Investigated or Planned
16	*Sweetwater Creek	Loudon, McMinn, Monroe	Tenn.	OR-21	37,640	Investigated or Planned
17	*Bent Creek	Hamblen, Hawkins	Tenn.	OR-21-1	29,900	Potential - WRS
18	*Blackwater Creek	Hancock, Lee (Va.), Scott (Va.)	Tenn.	OR-21-4	28,760	Potential - WRS
19	*Black Wolf Creek	Scott, Morgan	Tenn.	OR-20b	21,240	Potential - WRS
20	*Bull Run Creek	Anderson, Grainger, Knox, Union	Tenn.	OR-21-4	68,180	Potential - WRS
24	*Charles Creek	Cannon, Warren	Tenn.	OR-20d1	22,300	Potential - WRS

TABLE XLV (continued)

Upstream Watersheds - Identification and Location

Map No.	Watershed Name	LOCATION Counties	State	USDA Atlas of River Basin Number	Drainage Area (Acres)	Status 1/
WATER SUB-REGION J (continued)						
29	*Coahulla Creek	Bradley	Tenn.	SAG-33a1	38,500	Potential - WRS
26	*Mountain Creek	Warren	Tenn.	OR-20d1	30,930	Potential - WRS
27	*Perkins Creek	Scott	Tenn.	OR-20b	12,787	Potential - WRS
6	*Upper Bluestone River	Tazewell	Va.	OR-7a	47,174	Investigated or Planned
64	*Upper Clinch Valley	Tazewell	Va.	OR-21-4	36,846	Investigated or Planned
74	Copper Creek	Scott	Va.	OR-21-4	85,300	Potential - WRS
75	Headwaters Clinch River	Tazewell	Va.	OR-21-4	78,963	Potential - WRS
71	*Indian Creek	Lee	Va.	OR-21-4a	42,930	Potential - WRS
72	*Martin Creek	Lee	Va.	OR-21-4a	15,345	Potential - WRS

* Recommended watersheds.

1/ Completed - Works of improvement installed by July 1, 1967.
Authorized for Installation - A watershed project approved for construction (operations) by July 1, 1967.
Investigated or Planned - A watershed project investigated or approved for planning under a going or accelerated program with a written report of the findings by October 1, 1967.
Potential - WRS - A watershed studied for the Appalachian Water Resource Survey by October 1, 1967.

2/ Inactive.

3/ Included in comprehensive basinwide study planned by Tennessee Valley Authority.

4/ The U. S. Forest Service will make a detailed study and appraisal to supplement the proposed project before authorization for detailed planning is initiated.

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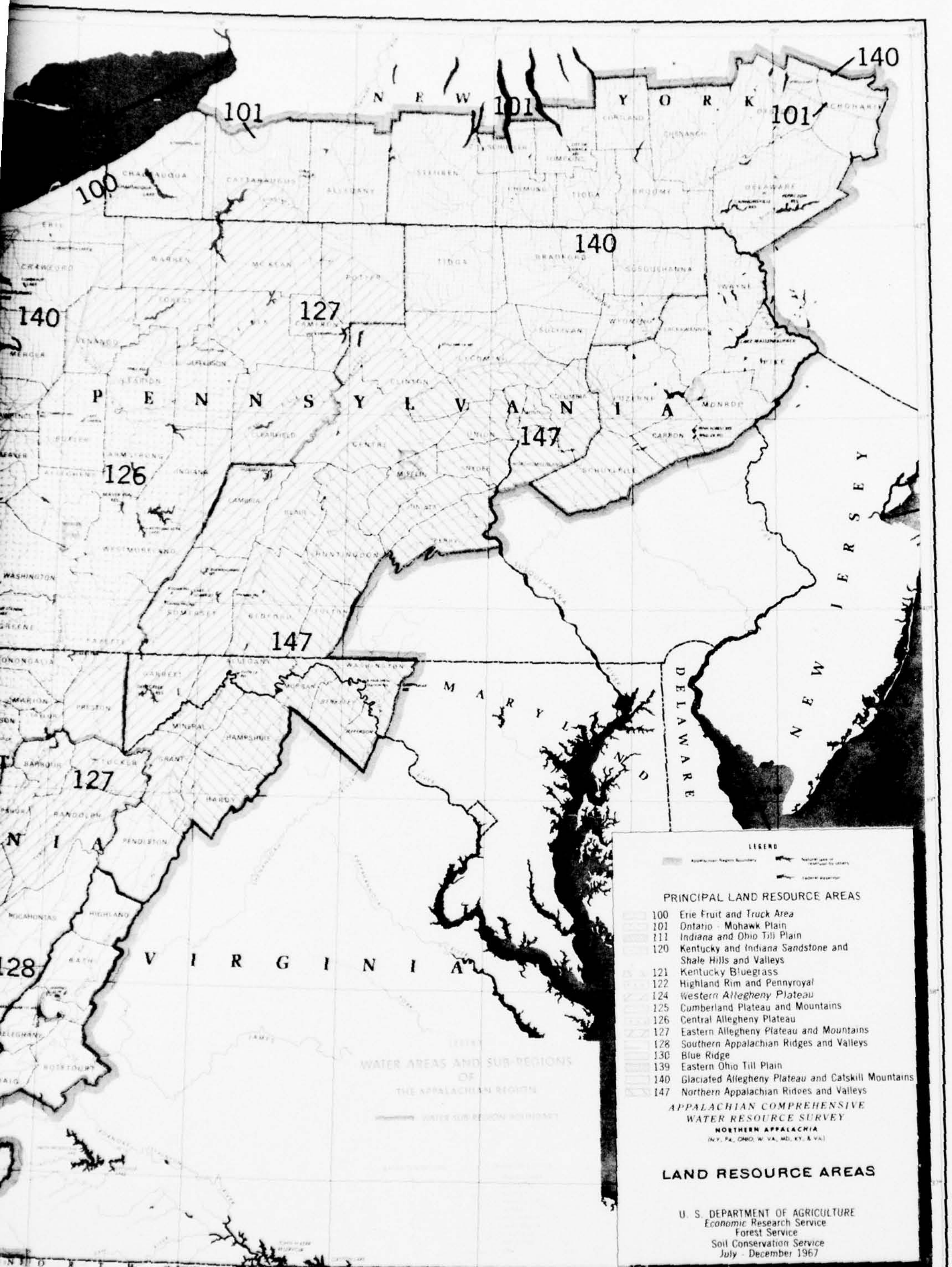
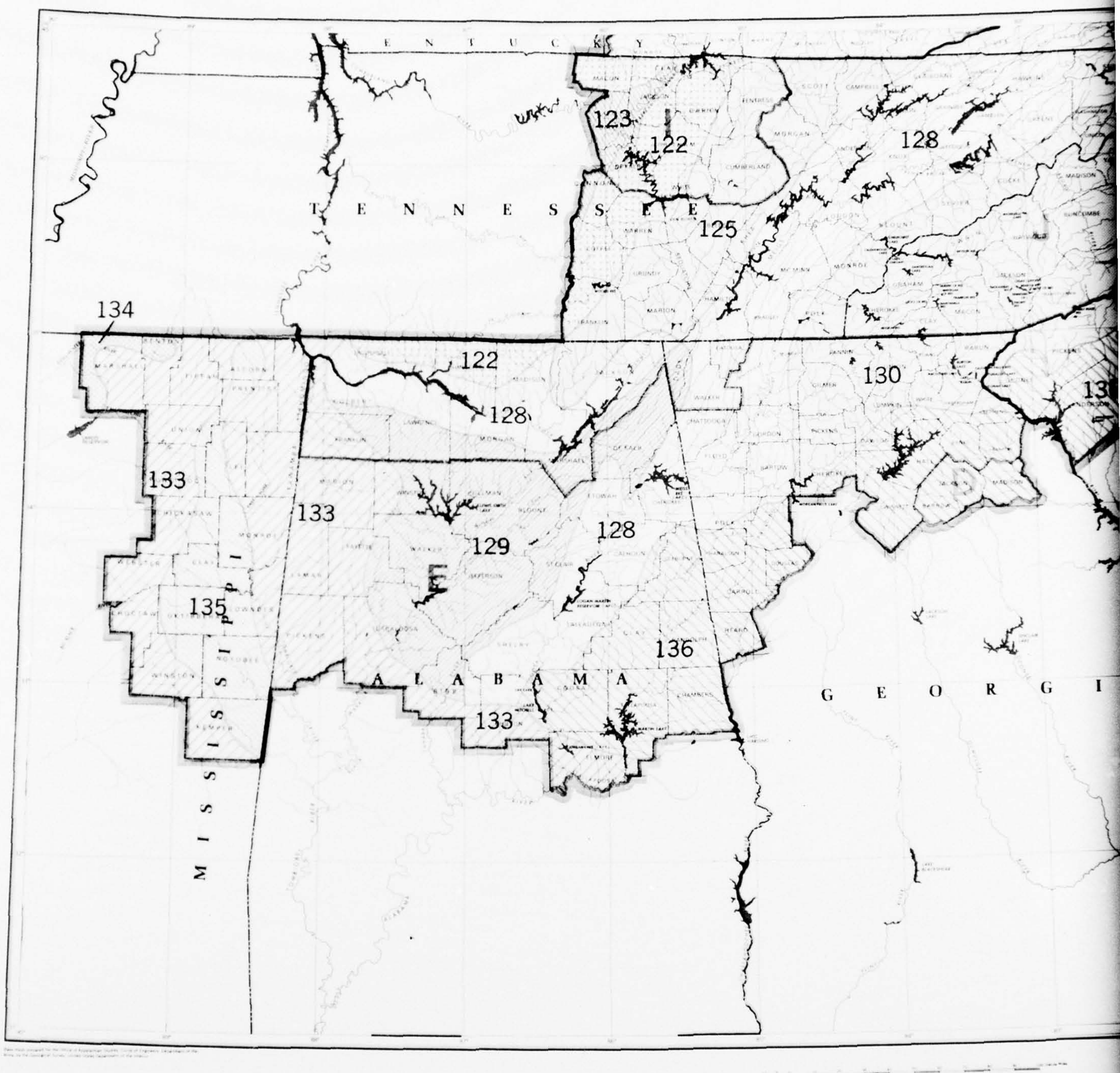


PLATE 1 - NORTH

APPENDIX A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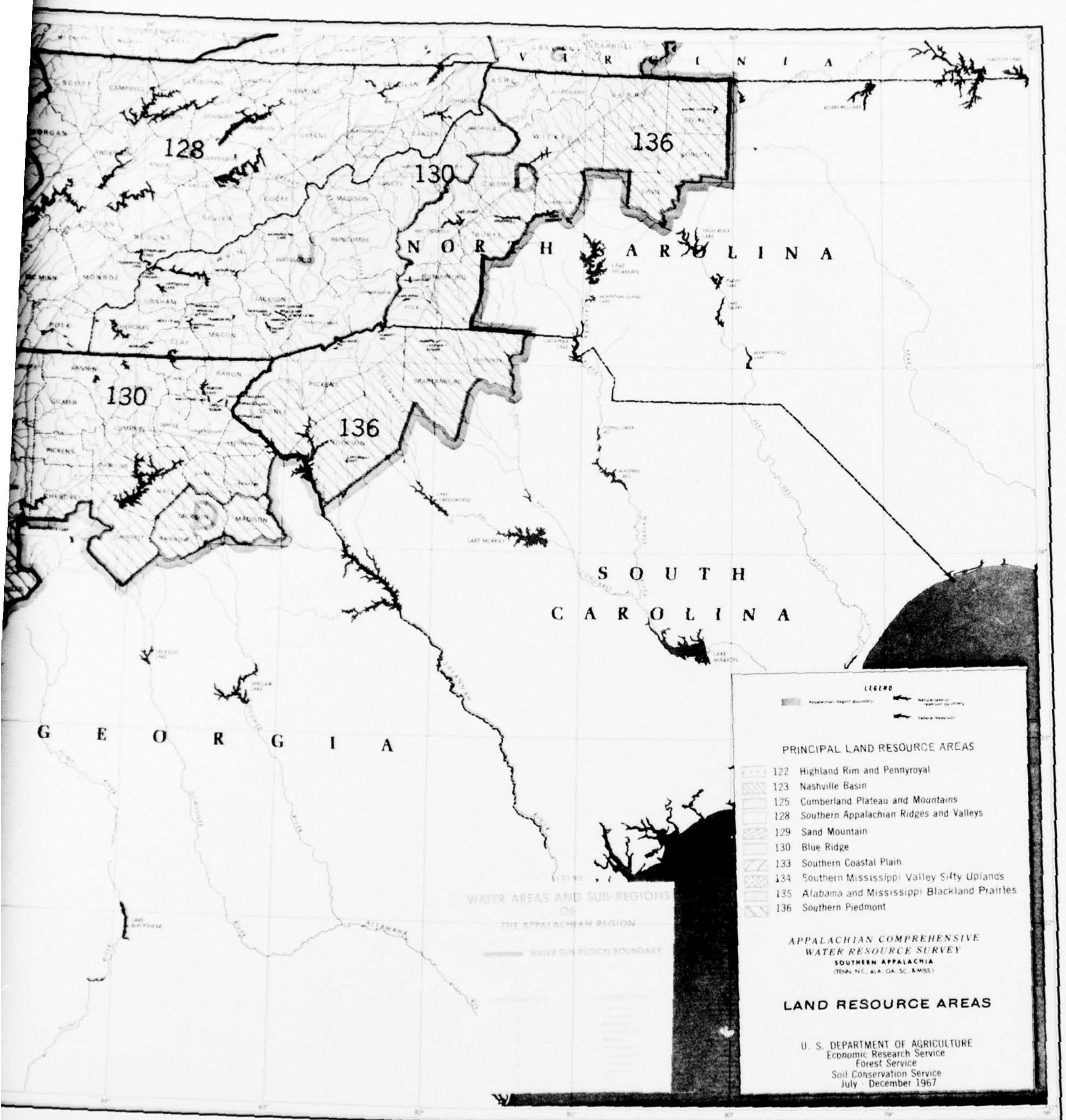

PLATE 1 - SOUTH

APPENDIX A

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PLATE 2 - NORTH

APPENDIX A

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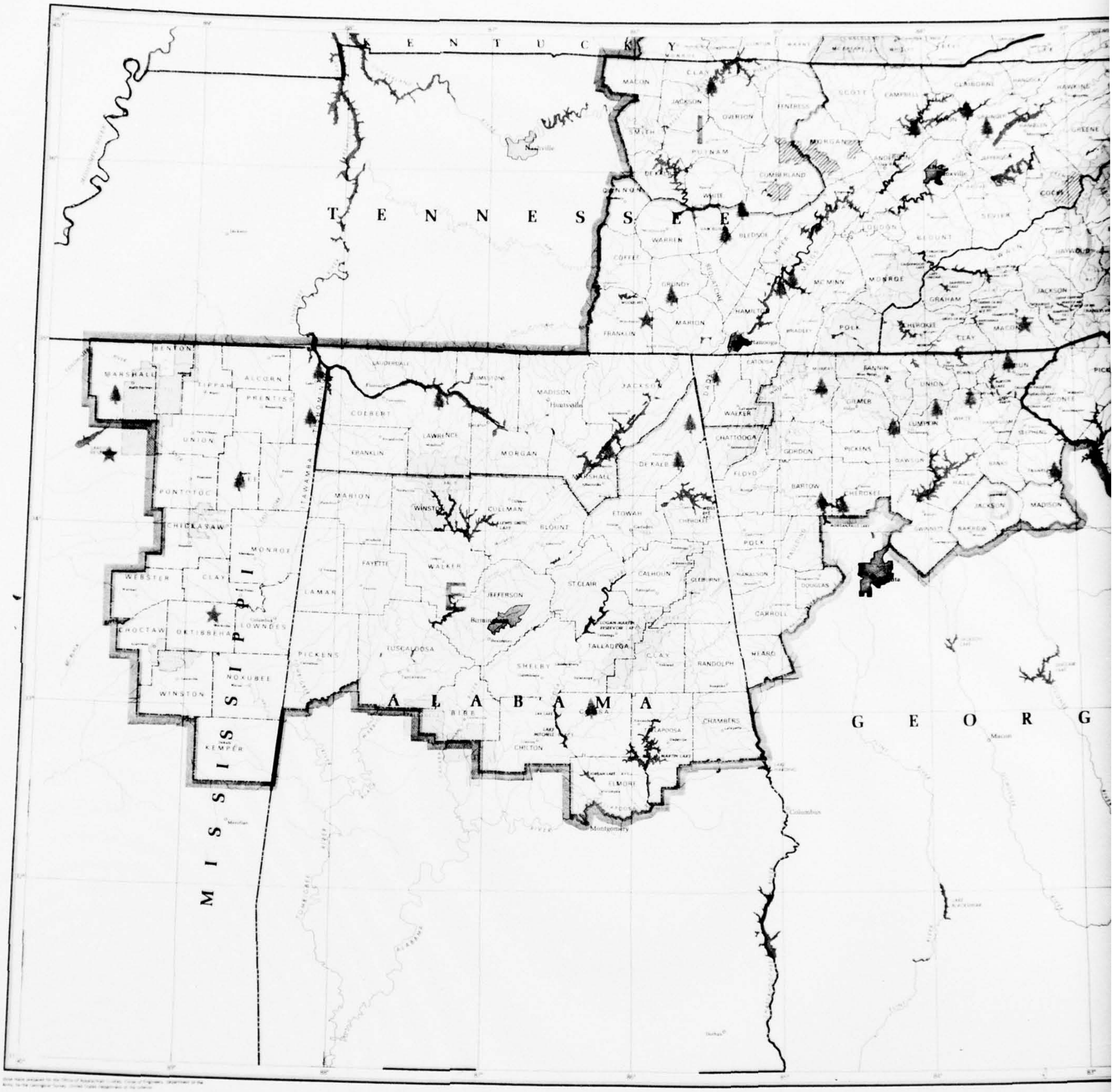

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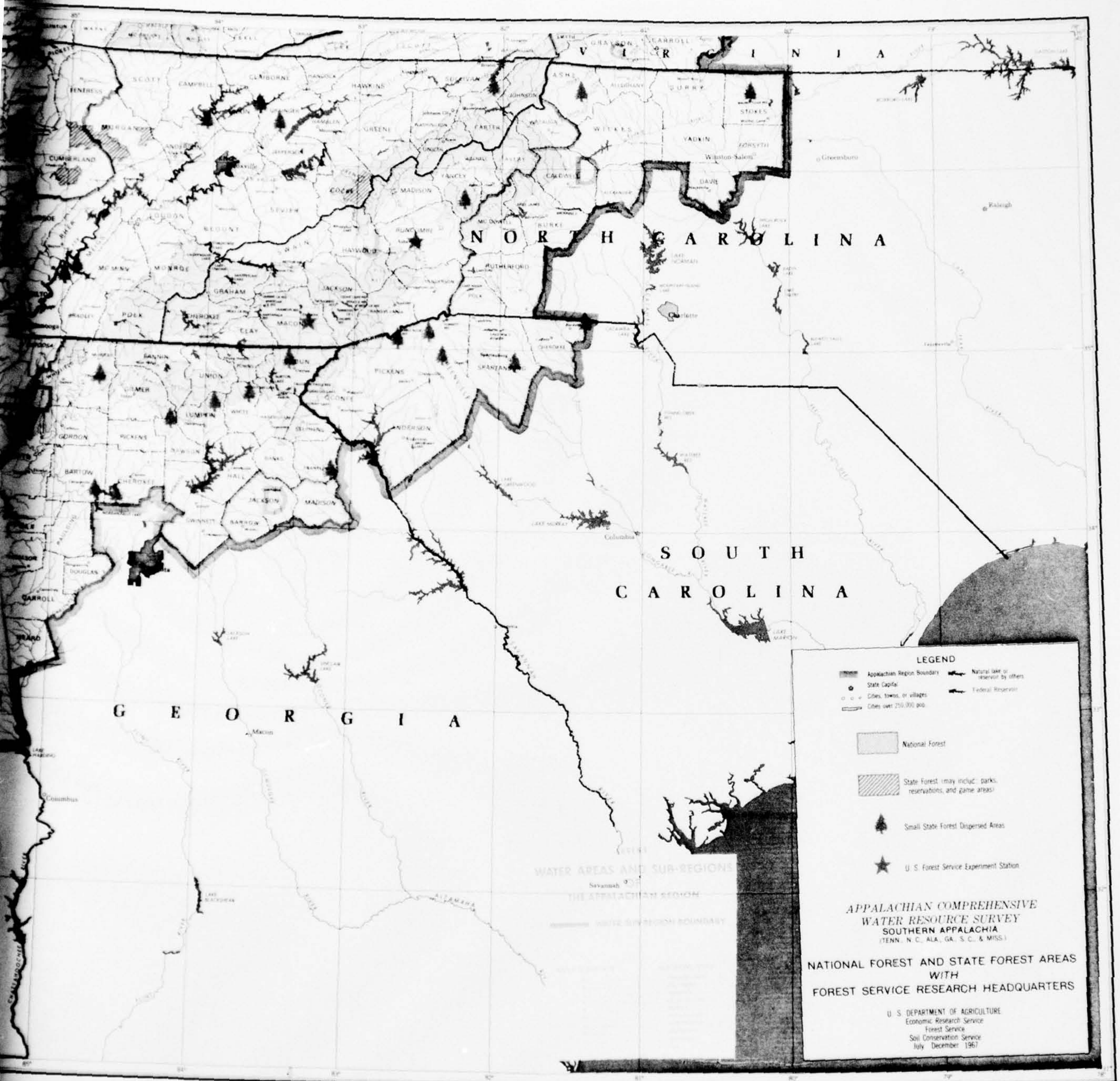

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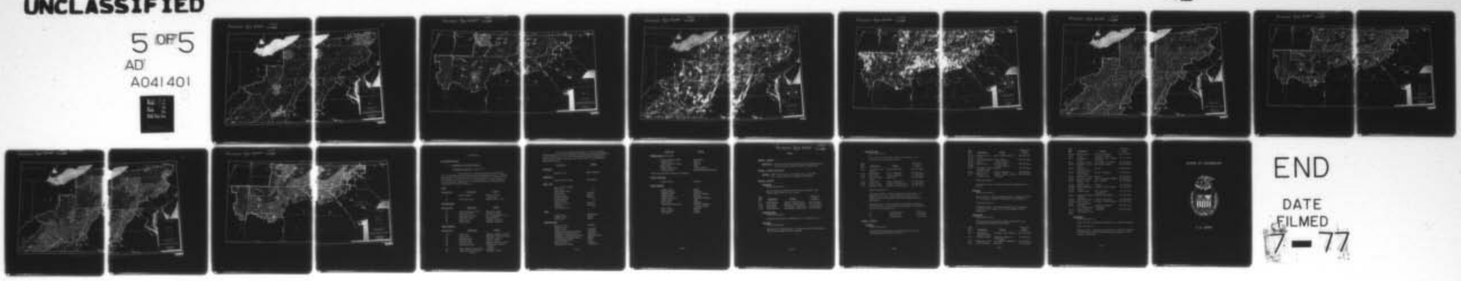

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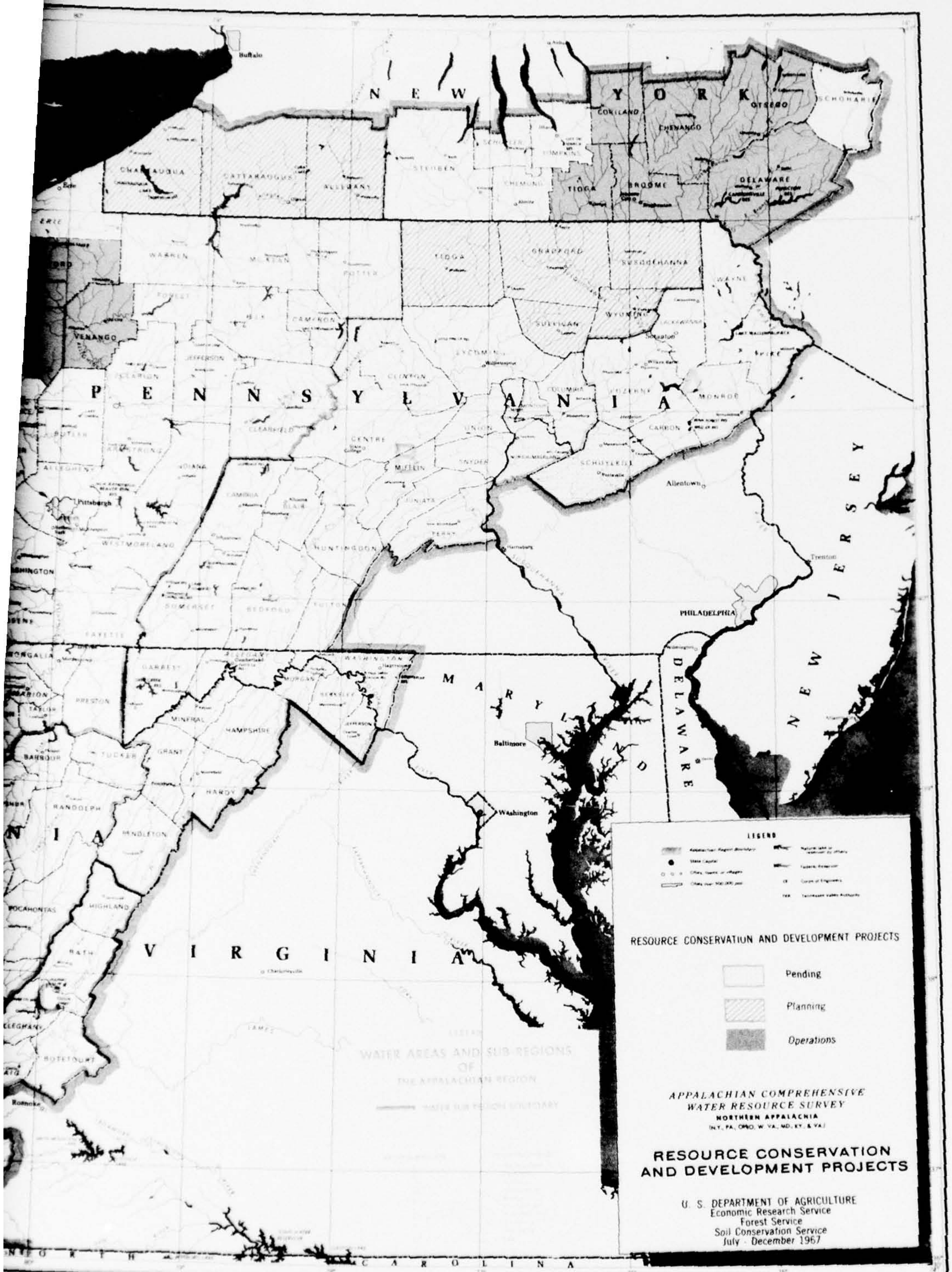

PLATE 3 - NORTH

APPENDIX A

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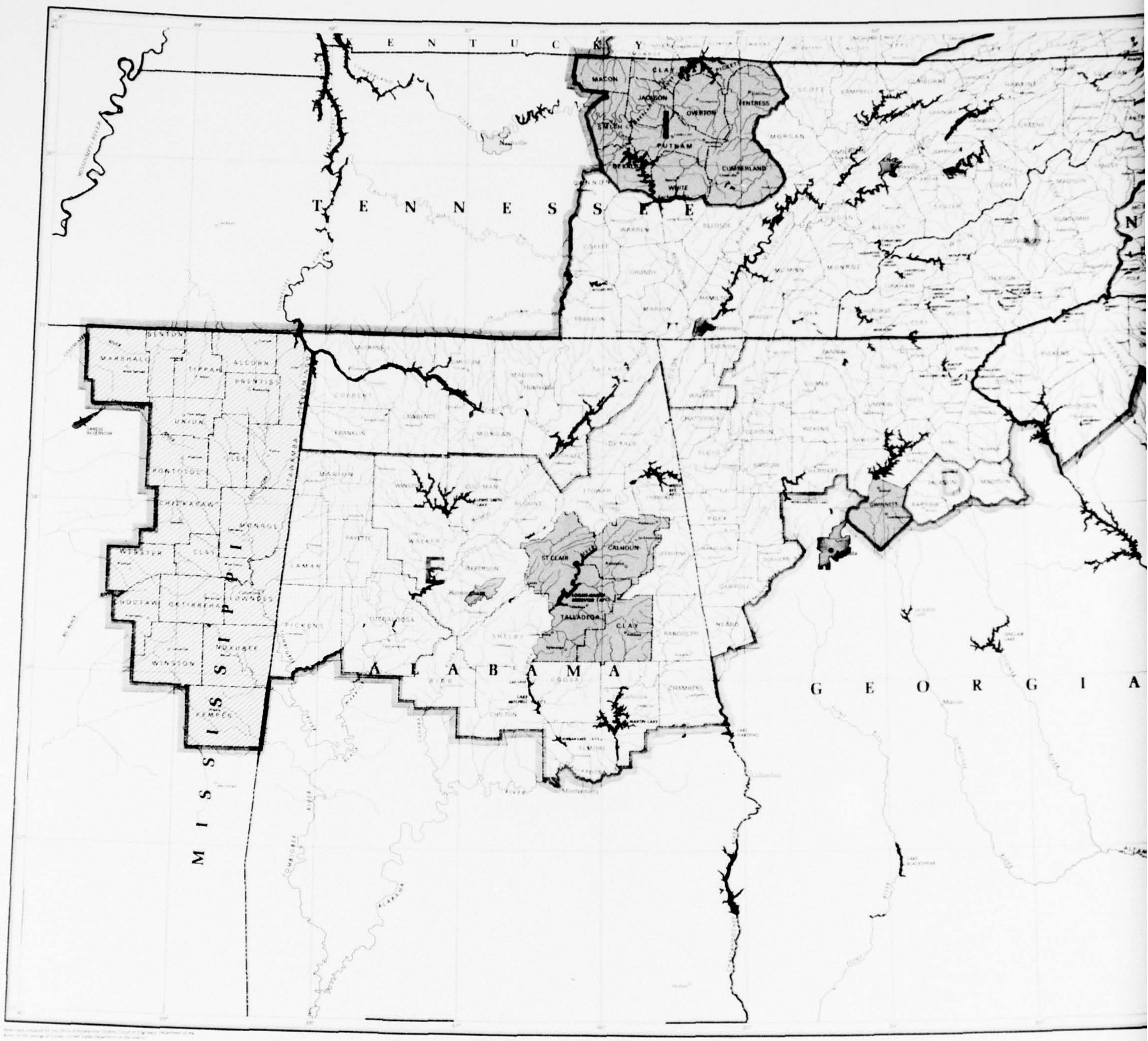

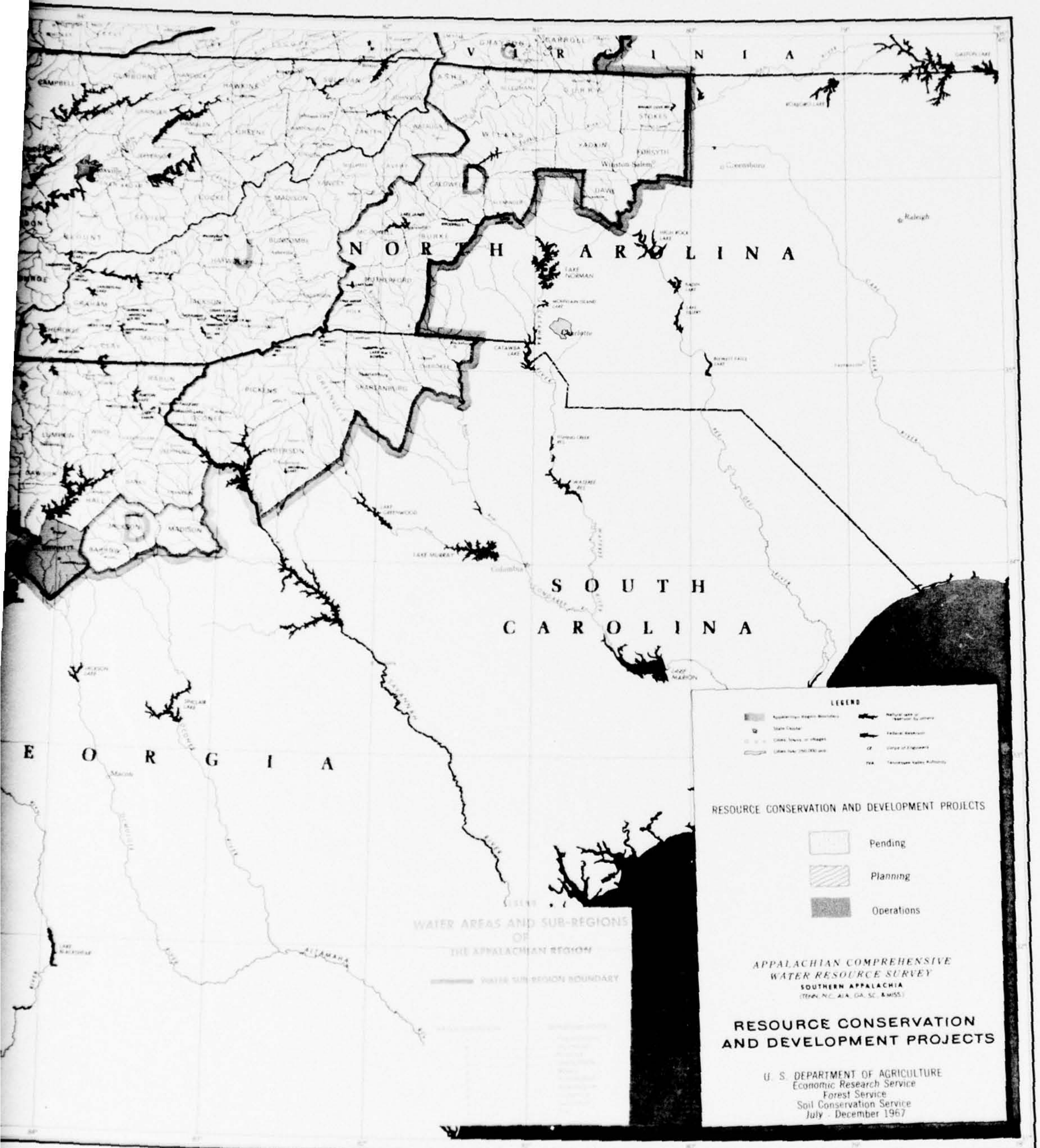

PLATE 3 - SOUTH

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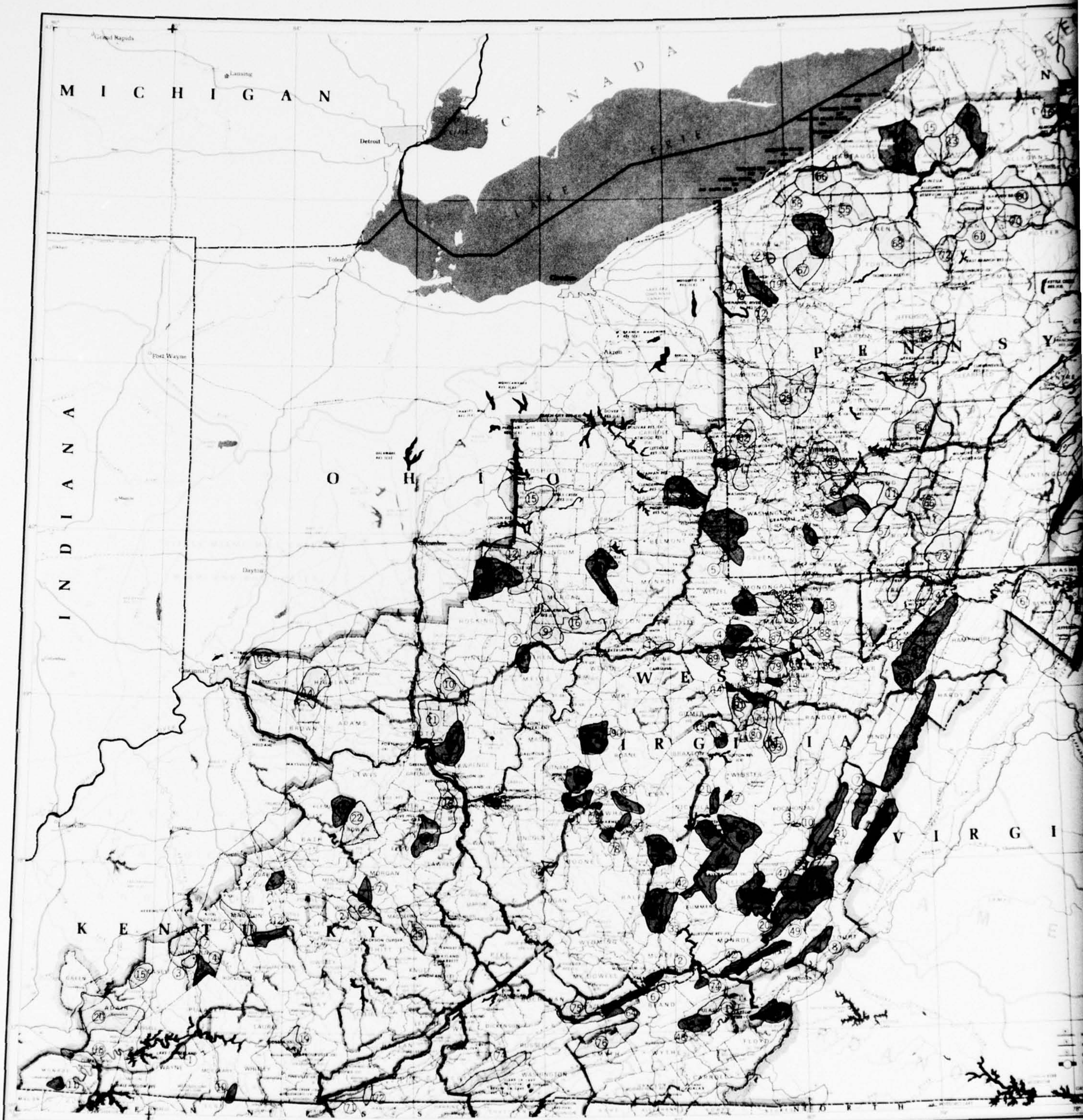

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PLATE 4 NORTH
APPENDIX A

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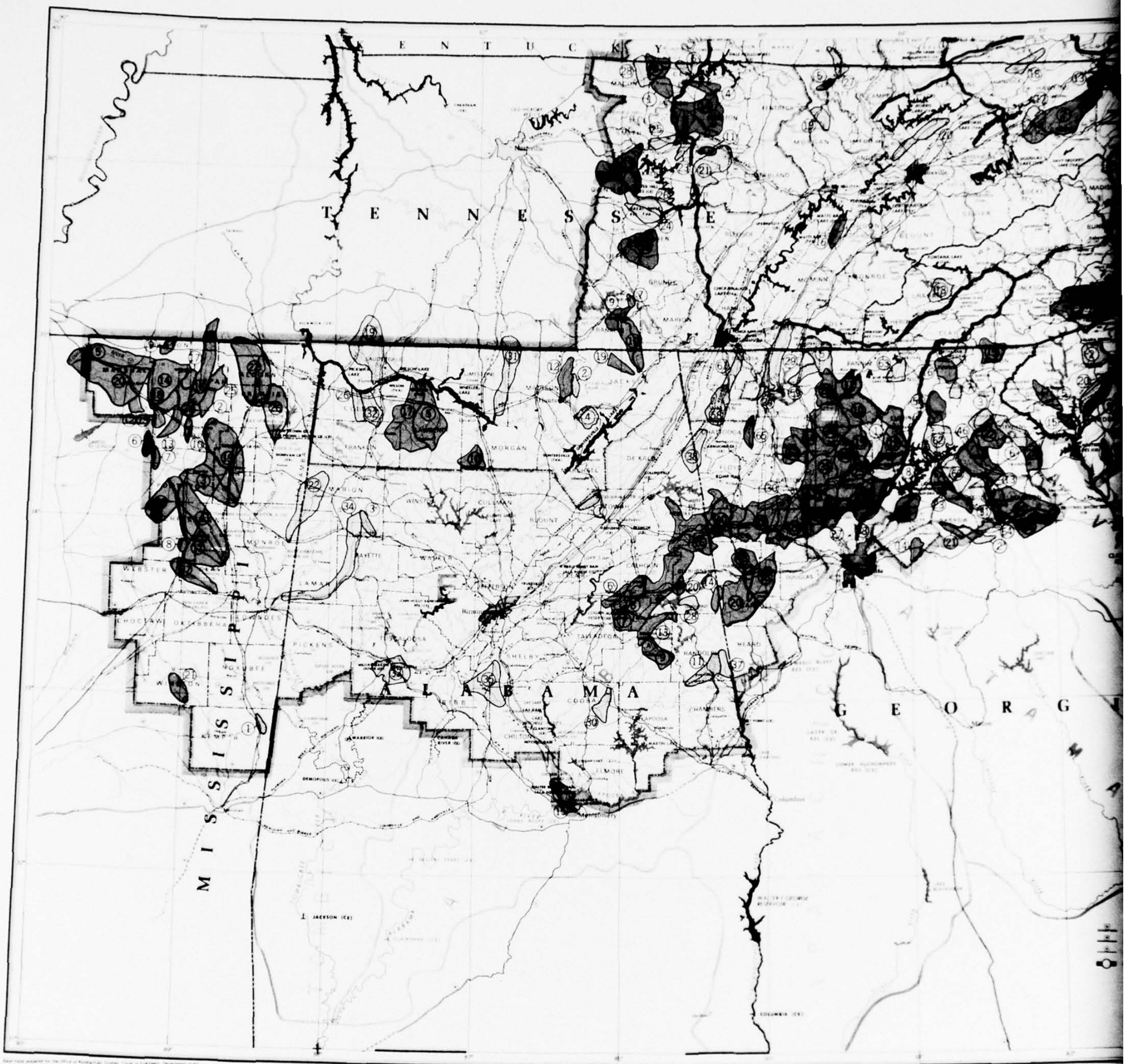

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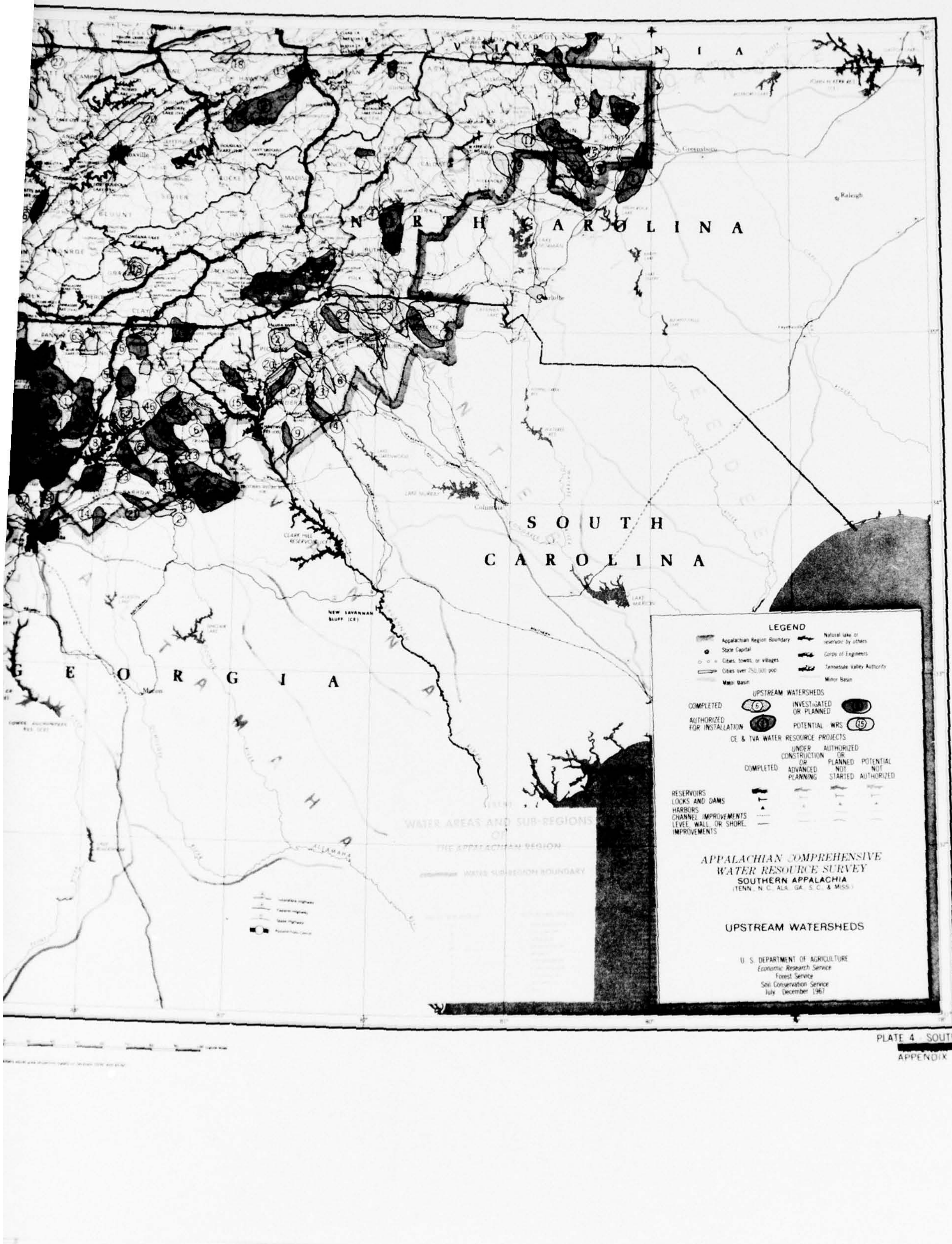

PLATE 4 SOUTH

APPENDIX A

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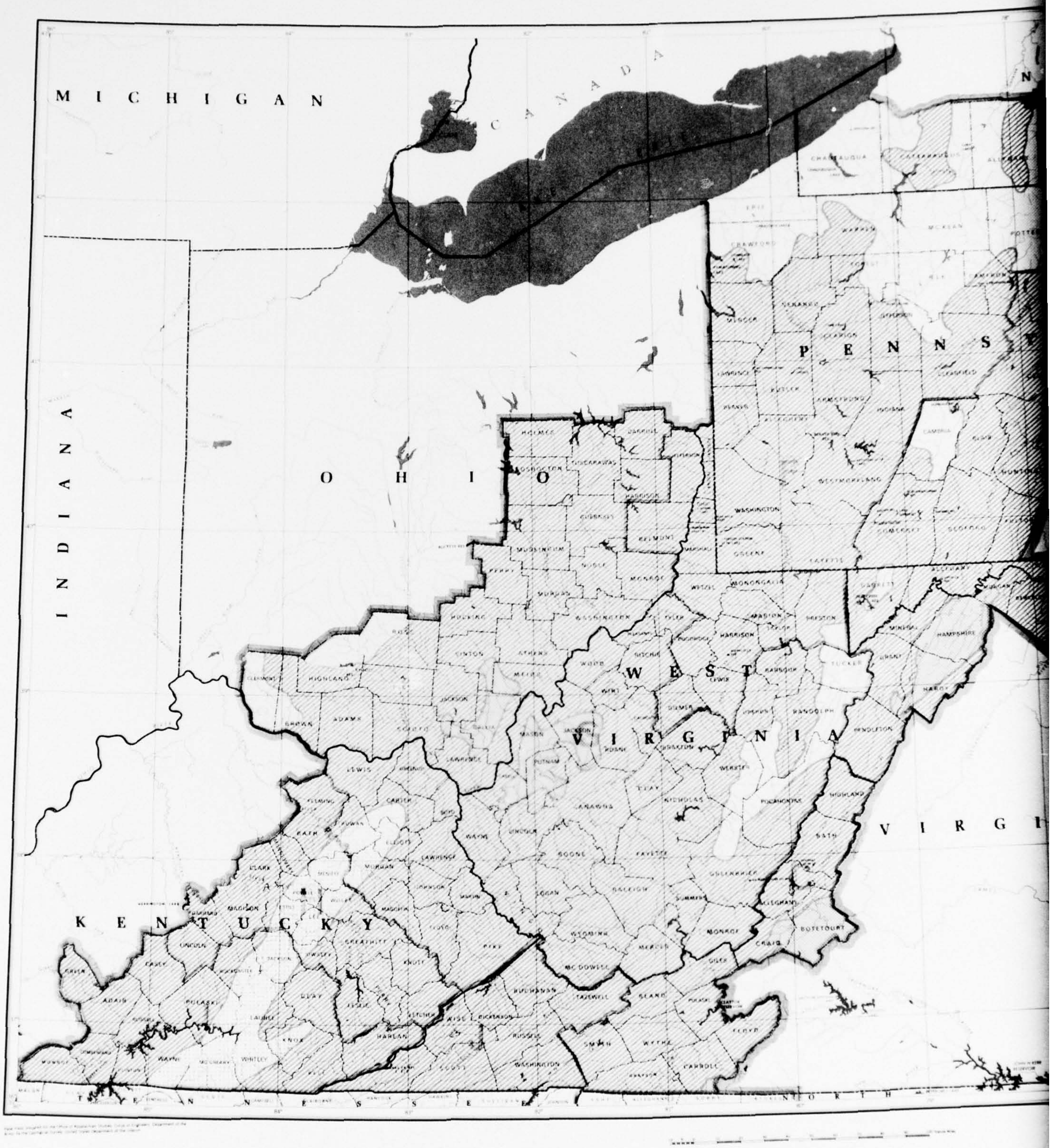

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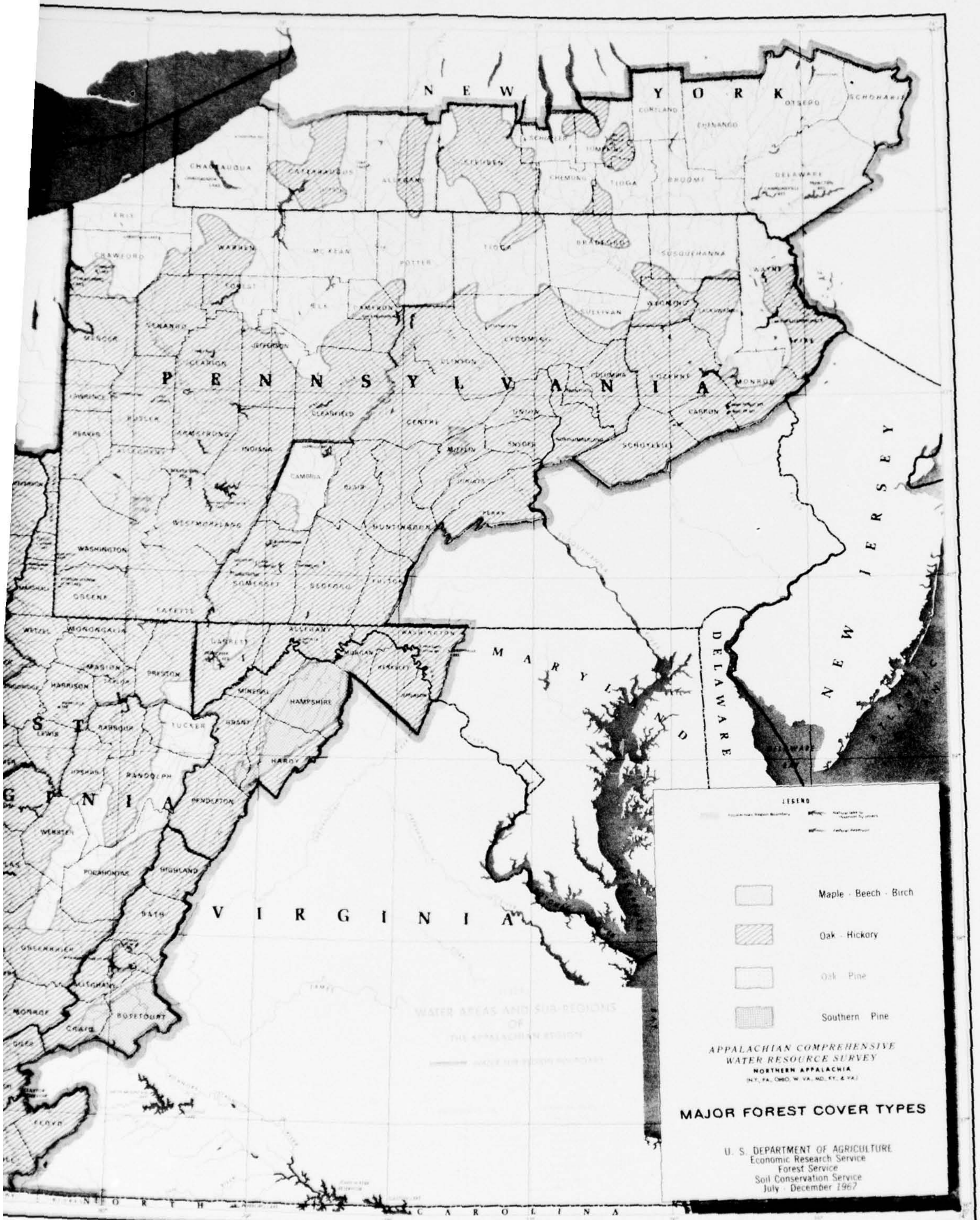

PLATE 5 - NORTH

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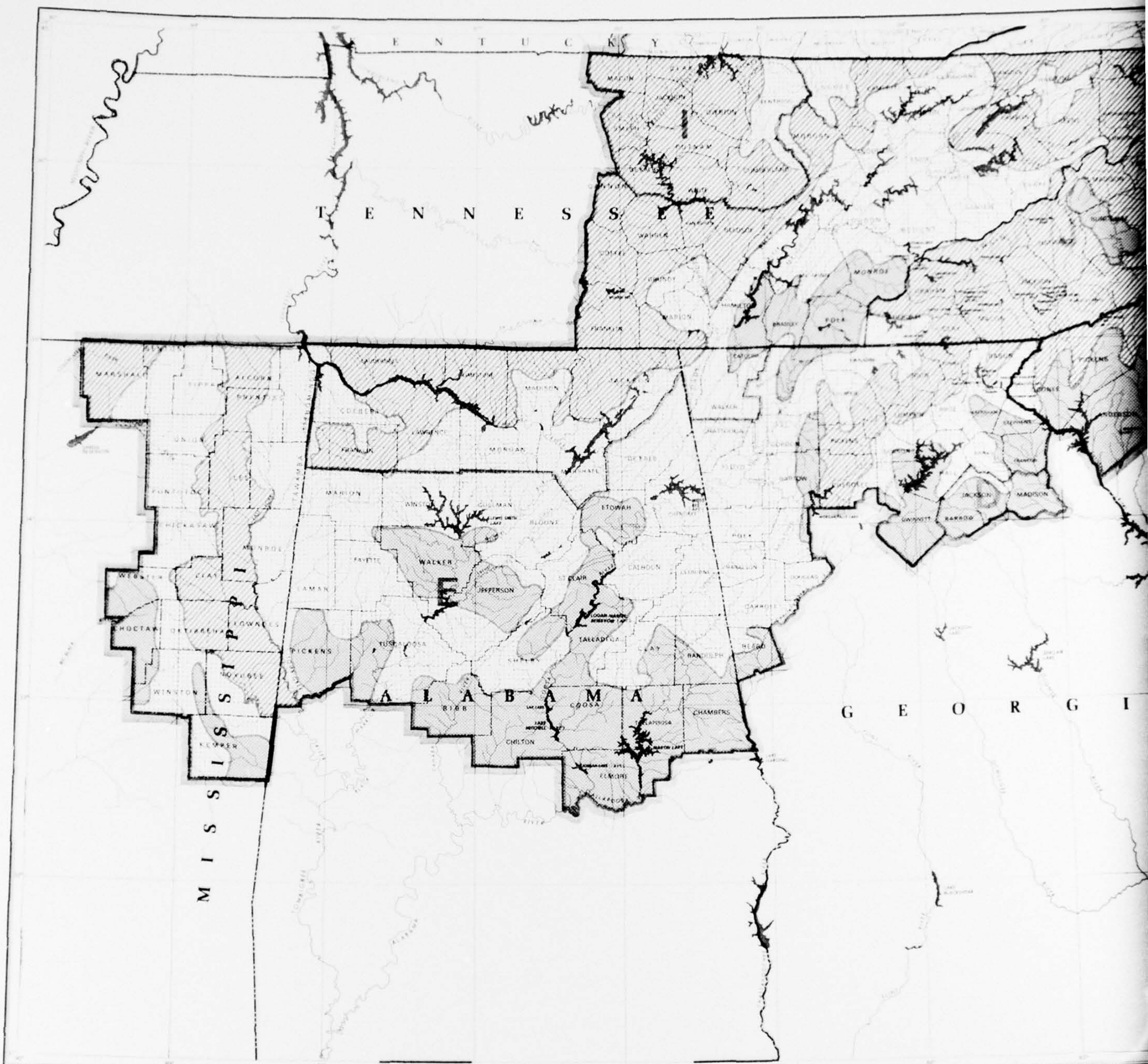

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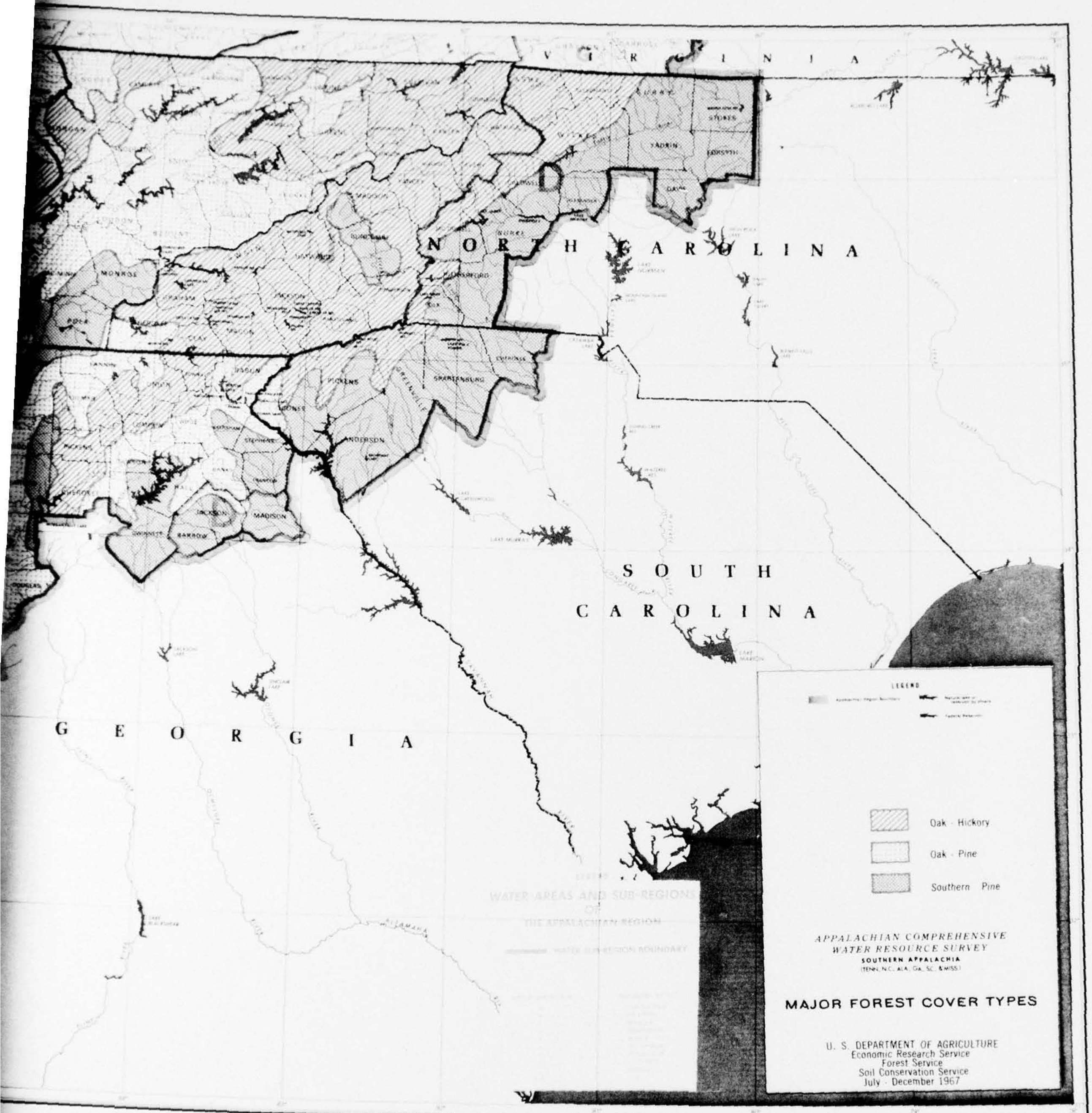

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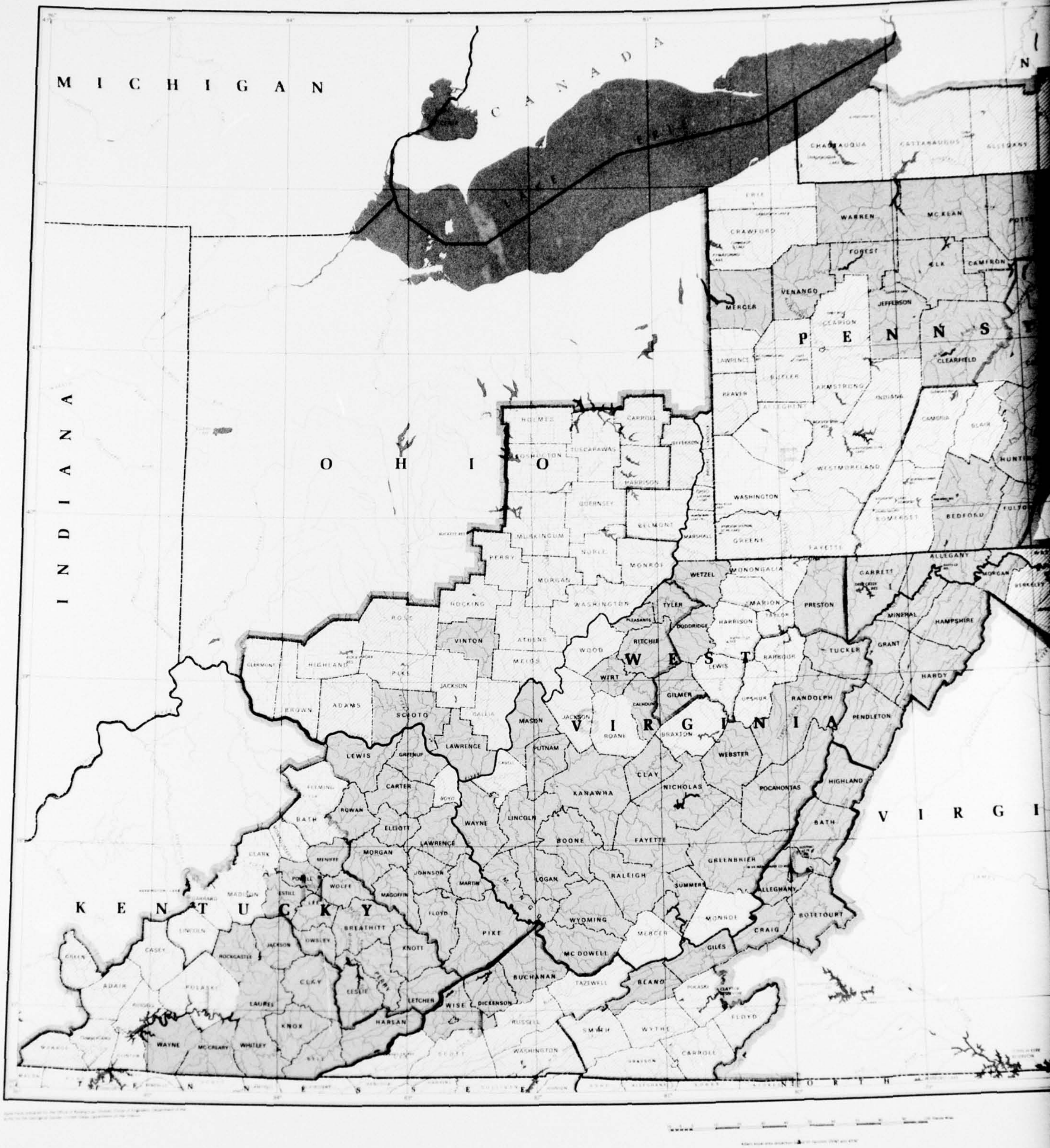

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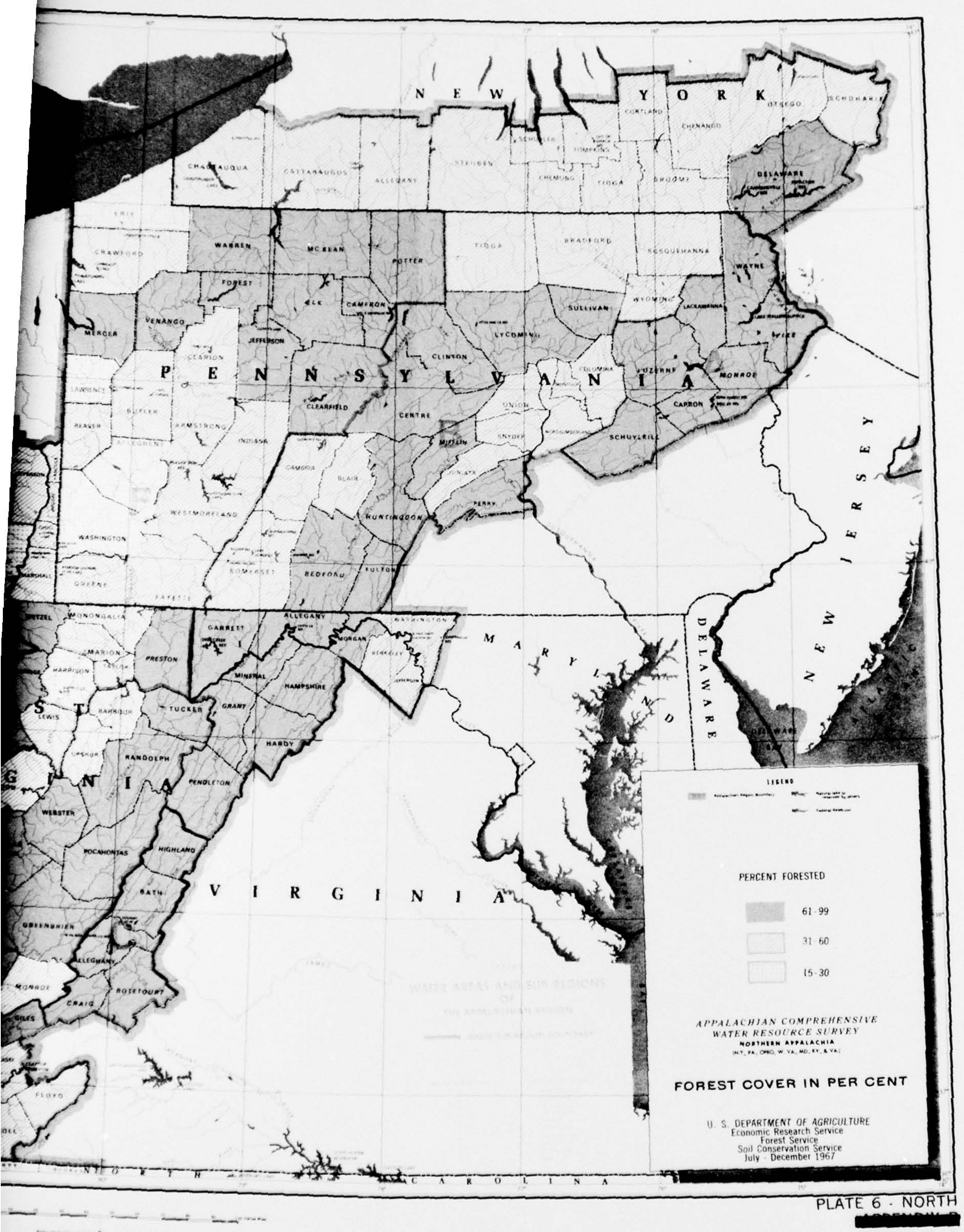

PLATE 6 - NORTH
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APPENDIX A

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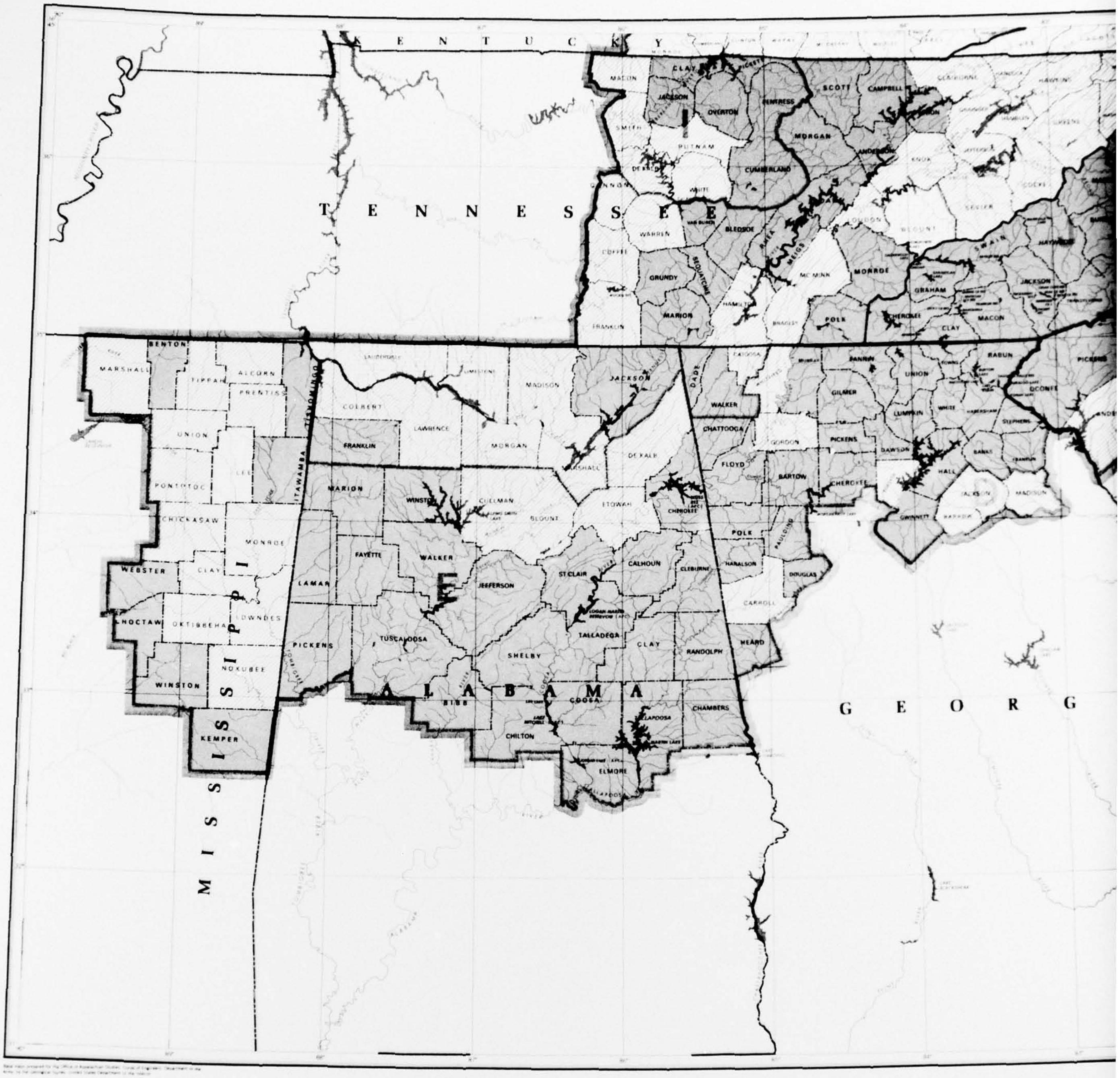

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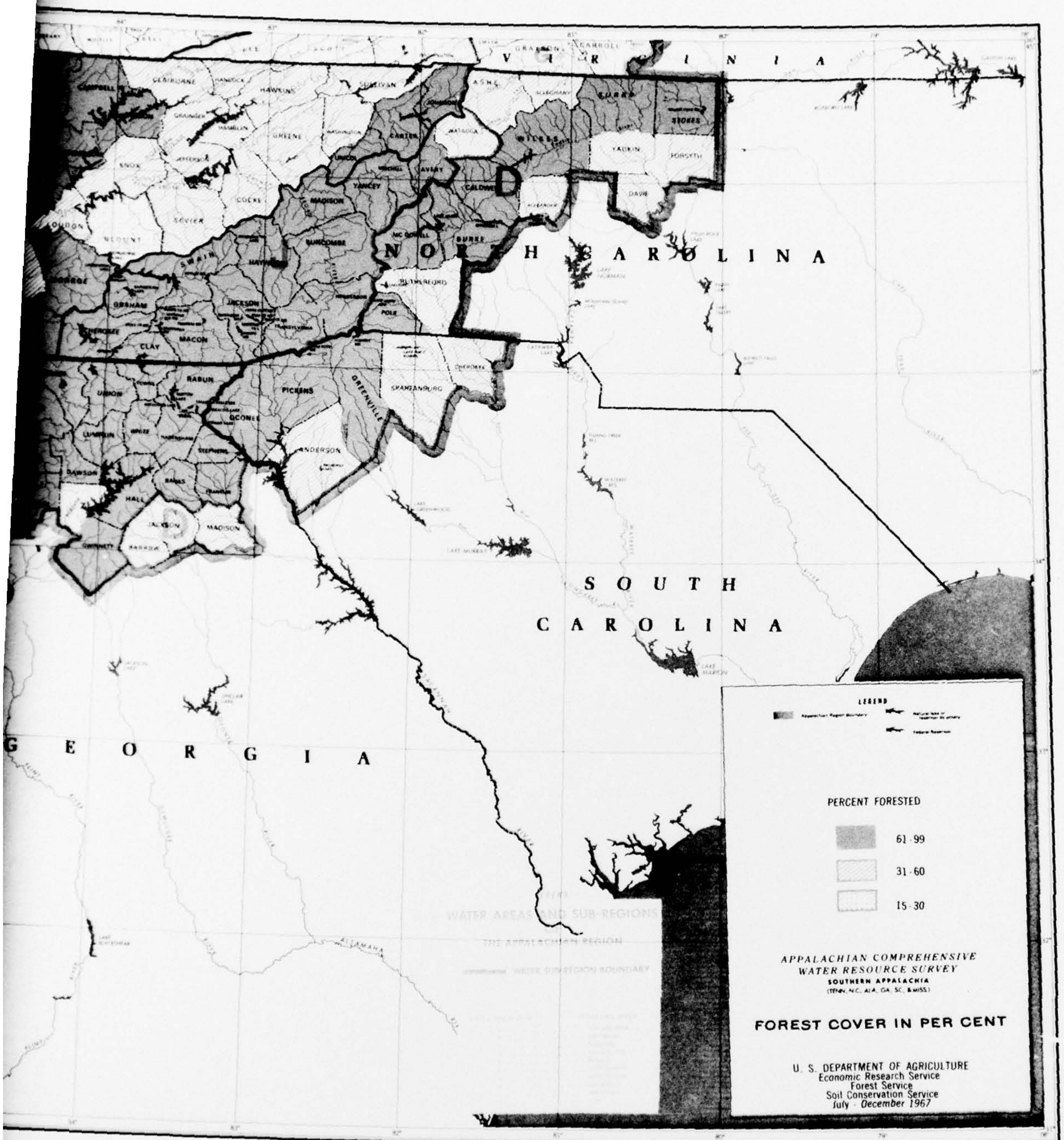

PLATE 6 - SOUTH

APPENDIX A

ADDENDUM

RECOMMENDATIONS

a. Acceleration of present programs

(2) Structural measures: Page A-154.

I. The following 16 recommended upstream watersheds have considerable nonrural expansion and developmental promise. Special authorization is being requested to prepare work plans in accordance with the principles and criteria of PL 83-566 and PL 89-4. During preparation of the work plans, appropriate costs will be allocated to expansion and development as a project purpose.

OHIO

Location No.	Watershed	County
9	Federal Valley	Athens, Morgan, Washington
10	Little Salt Creek	Jackson, Pike, Ross

PENNSYLVANIA

Location No.	Watershed	County
25	Connoquenessing Creek	Allegheny, Butler
54	Blacklick Creek	Cambria, Indiana
56	Upper French Creek	Erie, Chautauqua (N.Y.)
64	Sewickley Creek	Westmoreland
66	Stony Creek	Cambria, Somerset
73	Wills Creek	Bedford, Somerset

WEST VIRGINIA

Location No.	Watershed	County
79	Elk Creek	Barbour, Harrison, Upshur
81	Kings Creek	Hancock, Washington (Pa.)
82	Limestone Run	Harrison, Marion
85	Prickett Creek	Marion, Taylor
87	Simpson Creek	Barbour, Harrison, Taylor
88	Three Fork Creek	Monongalia, Preston, Taylor
89	Upper Middle Island Creek	Doddridge
93	Upper Buckhannon River	Randolph, Upshur

II. Since the cutoff date of July 1, 1967 for including upstream watersheds in this Appendix, the following upstream watersheds, as the result of new or local and continuation of various studies with state and other Federal agencies, have shown promise and potential as watershed projects:

	Watershed	County
KENTUCKY		
	Saltlick Creek	Bath, Menefee
MARYLAND		
	Little Antietam Creek	Washington
NEW YORK		
	Lake Otsego Tributary	---
	Still Creek	---
	Little Snake Creek	---
	Smith Brook	Cortland
	Thomas Creek	Broome
	Chenango Creek	Cortland
	Shapley Branch	---
	Crocker Creek	---
	Michigan Creek	Tompkins
	Mill Brook	Chenango
	Bear Swamp Pond	---
OHIO		
	Sugar Creek	Tuscarawas
	Sunday Creek	Athens
	Miller Run	Scioto
PENNSYLVANIA		
	*Towanda Creek	Bradford
	*Larrus Creek	---
	*Muncy Creek	Columbia
	Tributary of Catawissa Creek	Columbia
	Tributary of Roaring Creek	Columbia
	*Tributary of Mahantango Creek	Northumberland
	*Tributary of Tuscarora Creek	Mifflin
	Little Juniata Creek	Perry
	*Big Run Creek	Clinton
	*Sideling Hill Creek	Huntingdon

Watershed	County
PENNSYLVANIA (continued)	
*Little Aughwick Creek	Huntingdon
*Chapman Run	Bedford
Little Loyalsock Creek	Sullivan
*Babb Creek	Tioga
Upper Tioga River	Tioga, Bradford
Dundaff Creek	Susquehanna, Lackawanna

* From state and local surveys and studies.

Watershed	County
SOUTH CAROLINA	
Oolenoy River	Pickens
WEST VIRGINIA	
Spring Creek	Roane
Jumping Branch	Summers
Dunloup Creek	Fayette, Raleigh
Middle Creek	Hancock
Upper Birch River	Nicholas, Webster
Laurel Creek	Clay
Mill Creek	Kanawha
Upper Pocatalico River	Jackson, Kanawha, Putman, Roane
Davis Creek	Kanawha
Finney Branch	Putnam
Rock Branch	Putnam

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PLATE 3 - NORTH

KENTUCKY - The name of the long narrow part of the National Forest should be Daniel Boone instead of Cumberland.

PLATE 4 - NORTH and SOUTH

LEGEND - Add the following: See Table XLV, page A-333 for identification of numbered watersheds

PLATE 4 - NORTH

MARYLAND

Water Sub-region B

The following recommended upstream watersheds in the Potomac River Basin are not shown:

Map No.	Watershed	County	Watershed Area
P-3	North Branch	Garrett, Grant (W.Va.)	190,272 Acres
P-15	Town Creek	Allegany, Bedford (Pa.)	101,120 Acres
P-25	Tonoloway	Washington, Fulton (Pa.)	74,304 Acres
P-26	Licking Creek	Washington, Fulton (Pa.)	140,672 Acres

PENNSYLVANIA

Water Sub-region F

Westmoreland County - Watershed No. 11 should be No. 71.

VIRGINIA

Water Sub-region C

Bath County - Watershed No. 31 should extend up into Highland County and include the entire drainage.

WEST VIRGINIA

Water Sub-region B

The following recommended upstream watersheds in the Potomac River Basin are not shown:

Map No.	Watershed	County	Watershed Area
P-10	North Fork South Branch	Grant, Pendleton	218,112 Acres
P-11	South Branch	Grant, Pendleton	225,920 Acres
P-12	Mill Creek	Grant, Pendleton	62,080 Acres
P-19	Little Cacapon River	Hampshire	174,304 Acres
P-20	North River	Hardy, Hampshire	131,136 Acres
P-24	Sleepy Creek	Morgan, Frederick (Va.)	85,760 Acres
P-41	Opequon Creek	Berkeley, Frederick (Va.)	217,472 Acres

Water Sub-region G

Greenbrier County - Outline of upstream watershed No. 65 Gypsy Hill is too big. This watershed is only a small tributary (694 acres) directly above and through the town of Ronceverte.

Kanawha County - The following three upstream watersheds are not shown. All are small direct tributaries of the Kanawha River in the Charleston area.

31	Georges Creek	1,580 Acres
31	Lick Branch	1,090 Acres
31	Wertz Hollow	420 Acres

PLATE 4 - SOUTH

ALABAMA

Water Sub-region E

The following recommended upstream watersheds in the Tombigbee River Basin are not shown:

Map No.	Watershed	County	Watershed Area
A-13 & M-35	Scooba & Budka Creek	Green, Kemper (Miss.)	169,280 Acres
A-18 & M-21	Little Buttahatchia River	Lamar, Marion, Monroe (Miss.)	122,368 Acres
A-20 & M-24B	Yellow River	Fayette, Lamar, Lowndes (Miss.)	230,464 Acres
A-25	Woolbank, Beaver, Blubber Creek	Pickens	92,864 Acres
A-26	Lubbub Creek	Fayette, Pickens	186,368 Acres
A-27	New River & Borrow Creek	Fayette, Marion, Walker, Winston	164,928 Acres

Water Sub-region J

Lauderdale County - Change upstream watershed No. 19 to No. 27.

GEORGIA

Water Sub-region D

Barrow County - Upstream watershed No. 21 should be shown as "Completed" instead of "Authorized For Installation."

Water Sub-region E

Whitfield County - Upstream watershed No. 29 should not be shown in this county. It is only in Bradley County, Tennessee.

MISSISSIPPI

Water Sub-region E

The following recommended upstream watersheds in the Tombigbee River Basin are not shown:

Map No.	Watershed	County	Watershed Area
M-2	Twenty-Mile, Donovan Creek	Itawamba, Lee, Prentiss	144,192 Acres
M-4	Mackay's Creek	Itawamba, Prentiss, Tishomingo	93,440 Acres
M-7	Mantachie Creek	Lee, Monroe, Itawamba	122,240 Acres
M-8	Reed Cummings	Itawamba	78,528 Acres

Map No.	Watershed	County	Watershed Area
M-9 & A-15	Bull Mountain Creek	Monroe, Itawamba, Franklin, Marion	234,816 Acres
M-11	Tallabinnela Creek	Chickasaw, Lee, Monroe, Pontotoc	56,576 Acres
M-12	Cowpenna Creek	Lee, Monroe, Itawamba	41,472 Acres
M-14	Mattubby & James Creek	Chickasaw, Monroe	124,160 Acres
M-15	Weanners & Stanefer Creek	Monroe	122,496 Acres
M-19	Kang Kettle & Town Creek	Monroe, Lowndes	56,384 Acres
M-20	McKinley's Creek	Monroe	64,384 Acres
M-22	Trim Cane Creek	Clay, Oktibbeha, Webster	115,328 Acres
M-23	Spring & Town Creek	Clay, Monroe	69,184 Acres
M-24	Stinson Creek	Lowndes	51,520 Acres
M-24c & 23a	Lower Luxapalila Creek	Lowndes, Pickens (Ala.)	80,256 Acres
M-25	Catalpa Creek	Clay, Lowndes, Oktibbeha	83,648 Acres
M-26	Cypress & Talking Warrior	Choctaw, Oktibbeha	93,120 Acres
M-27	McCowers Creek	Lowndes, Noxubee	171,392 Acres
M-28 & A-23	Ellis, Nash & Kincade Creek	Lowndes, Pickens (Ala.)	101,760 Acres
M-31	Browning & W. Water Creek	Lowndes, Noxubee, Oktibbeha	104,892 Acres
M-32, 34 & A-14	Bogue Chitto & Woodward Creek	Noxubee	194,816 Acres

TENNESSEE

Water Sub-region I

Putnam County - Upstream watershed No. 11 should be deleted.

Water Sub-region J

Bradley County - Upstream watershed No. 29 shown in Georgia and extending up into Tennessee should be restricted to that portion in Tennessee.

CORPS OF ENGINEERS

U. S. ARMY